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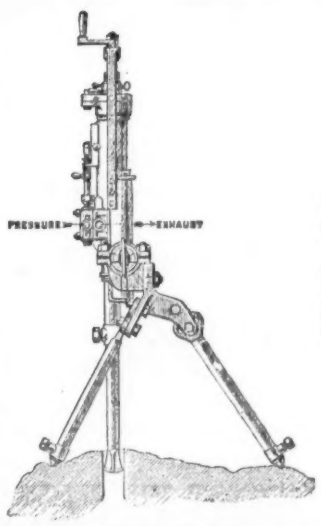

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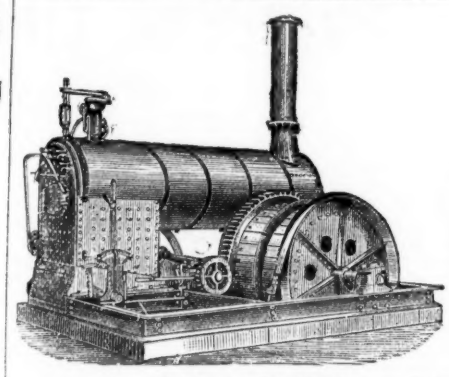

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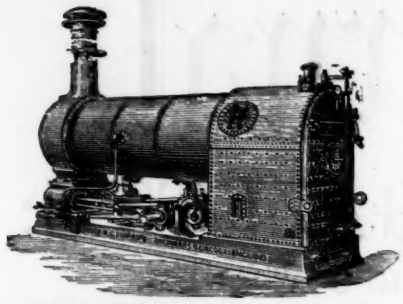

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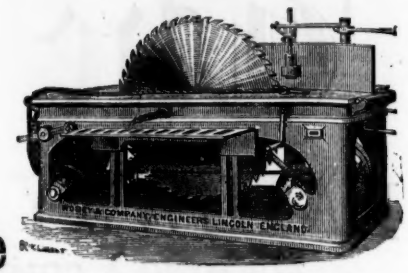

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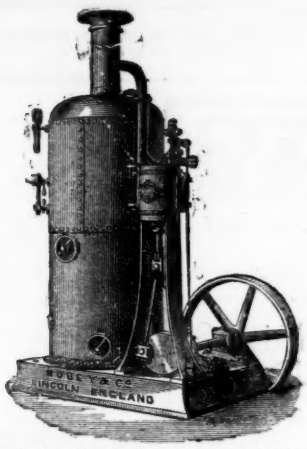

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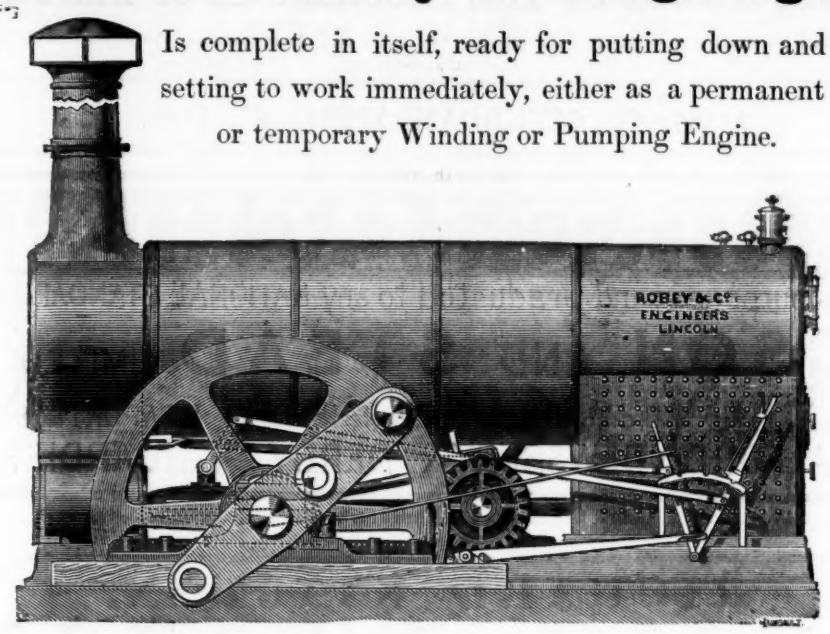

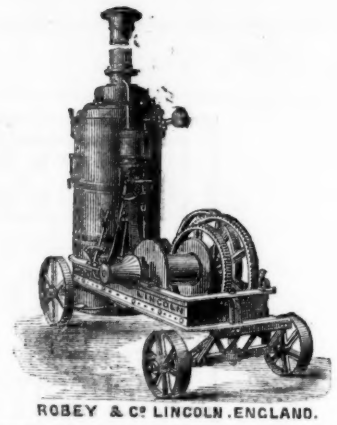

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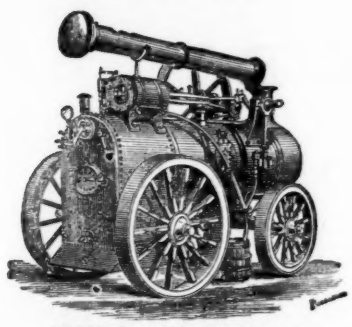

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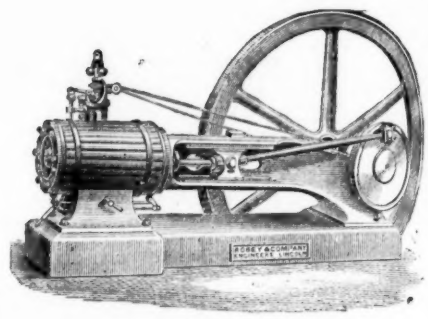

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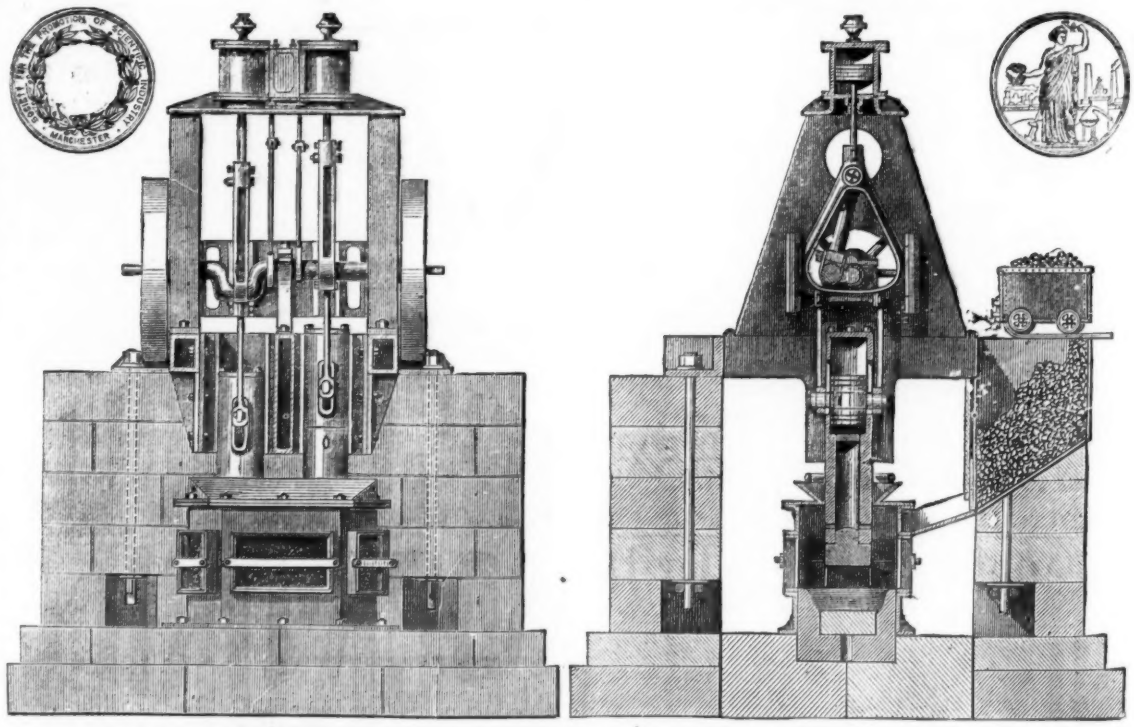

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Original Correspondence.

FROM AMERICA—PIG-TIN STATISTICS.

Jan. 1, 1880.—Stock in hands of dealers, importers and speculators	Tons	1725
Arrivals in New York and Boston from Jan. 1, to April 1:—		
Straits and Malacca.....	Tons 2760	
Australian, via London	395	
Billiton, direct and via Holland.....	910	
English, L. and F. and refined	435	= 4490
Total	Tons	6215
Consumption (estimated), Jan. 1 to April 1:—		
Straits and Malacca	Tons 2700	
Australian	350	
Billiton	300	
English, L. and F. and refined	350	= 3700
Stock, April 1, dealers, importers, and speculators ...	Tons	2515
Consisting of—Straits and Malacca	Tons 1350	
Australian	250	
Billiton	800	
English	115	
Total	Tons	2515
Stock afloat to United States April 1:—		
Straits, December, sail.....	Tons 280	
Straits, ex January, February, and March, sail and steam	2440	
Billiton (estimated)	(nil)	
Australian (estimated).....	400	= 3620
Total supply, spot and afloat	Tons	6135

Fulton-street, New York, April 3. EDWARD P. WHITE.

THE ST. GOTHARD TUNNEL—No. II.

SIR,—In the notice of this great Alpine tunnel in last week's Journal details were given of the levels and gradients, strata passed through, and the water issuing therefrom, dimensions of the tunnel, methods of excavating and blasting, the rate of progress, the air compressing machinery, and the ventilation of the tunnel. The experience gained in the execution of the Mont Cenis Tunnel was turned to account at St. Gothard—a more rapid progress was realised in the driving, and this was achieved by a selection of machinery, such as ventilators, air compressors, and rock-drills, the best adapted for the work to be performed. The method of ventilating the St. Gothard Tunnel appears to have been very inadequate for the object in view, the removing noxious gases generated from the strata, and in the various operations of blasting with dynamite, the combustion of lamps, &c. This was more particularly felt when the tunnel extended to 4 and 4½ miles in length on each side, and the temperature rose as high as 85° and 90° and upwards; the difficulties of ventilating and cooling the tunnel then became greater. The pestiferous nature of the atmosphere has frequently been the subject of comment, and when it is considered that the work of blasting alone has occasioned many deaths, and the impure atmosphere probably an equal number, there will, it is thought, be more consideration given to this question should a third tunnel through the Alps, now projected, be carried into execution.

The ventilators at the north end of the tunnel were completed in June, 1875. They are of the form known as bell-exhausters, and act on a principle similar to Struve's ventilator. There were two bells of sheet-iron 16 ft. 5 in. diameter, 4 ft. 11 in. stroke, one being attached to each end of an oscillating beam; these rise and fall alternately over fixed bells, closed at the top, with water joints. A full charge would draw about 2060 cubic feet with a double oscillation. Allowing for imperfect vaccum, ten double oscillations per minute should exhaust 16,500 cubic feet of air per minute. The air from the interior of the tunnel was exhausted through a tube 4 ft. 10 in. diameter, placed under the soffit of the arching, extending as far as the arch was completed.

ROCK-DRILLS.—Dubois and Francois's drill was the first used in this tunnel; its principle is similar to that of Sommeillers, used at Mont Cenis. The Dubois and Francois drill has four motions:—1. The blow.—2. The turning of the drill after each blow.—3. The advancement or feed by hand to follow up the work.—4. The withdrawal of the machine when a charge is to be made or the hole is completed. The percussion cylinder 2·76 in. diameter, the piston-rod 2 in.; length of stroke varies from ⅜ in. to 7·2 in. The percussion piston weighs 62 lbs.; the whole machine is 4⅓ cwts.; its length is 7·2 ft. Octagonal steel was used for boring, 1 in. in diameter. In hard rock a length of 4 ft. was used; in medium rock, 5 ft.; in easy rock, 6 to 6½ ft. Capacity of cylinder 79·3 cubic inches; compressed air used per stroke, 97·6 cubic inches.

Ferroux's drill superseded the above, owing to its superior performance. The percussion cylinder is advanced by an automatic movement, keeping pace with the progress made in boring. Percussion cylinder, 3·36 in. diameter; piston-rod, 2·8 in.; maximum length of stroke, 6·4 in.; weight of the machine, 4·91 cwts.; length 10·8 ft.; capacity of percussion cylinder, 104 cubic inches; compressed air used per stroke, 104 cubic inches. In regular work made 250 to 300 strokes per minute.

In 1874 trials were made with perforators at the north side of the tunnel, actuated by an effective pressure of 5½ atmospheres:—

The Ferroux drill bored	1·6	in. per minute
McKean drill bored.....	1·4	„ „
Dubois and Francois drill bored..	1·02	„ „

In the year 1875 improvements were made in the McKean drill, and after a series of comparative trials in hard granitic gneiss the performance of the McKean drill was proved to be decidedly superior to all its competitors. M. Favre then obtained for future operations 60 of these drills. The body of McKean's drill was made of cast phosphor bronze; air cylinder, 4 in. diameter; piston of wrought-iron, 2 in. thick; piston-rod, 2¼ in. diameter, screwed and pinned into the piston. Stroke varied from 2 to 5 in.—in regular work was 3½ in. The machine bored to a depth of 3 ft. without change. About 62 cubic inches of compressed air used for a stroke of 4 in. The drill could be moved with 7½ lbs. pressure, and could make from 500 to 700 strokes per minute, with an effective pressure of 5½ atmospheres. The weight of the machine, 4·52 cwts.; length, 7½ ft. At the trials referred to the drill, while at work, penetrated from 3 to 8 in. per minute, making 800 strokes; with a pressure of 6½ atmospheres it has penetrated 12 in. in a minute. The McKean drill was preferred for its simplicity and efficiency. The turning of the drill is effected by means of a cylindrical enlargement, with spiral grooves formed on the piston-rod. The whole of the motions originate from this enlargement—the turning of the drill, the feed, and the valve motion.

For a period of three years, up to September, 1878, Ferroux's machines were used exclusively in the north end, and McKean's at the south end. Mr. Ferroux simplified his machine in 1876; its weight was reduced from 4·91 to 3·57 cwts. The McKean machine was also modified in 1877 by an alteration in the position of the spiral-grooved cone.

LOCOMOTIVES.—In January, 1874, a locomotive on four wheels, driven by compressed air, weight 5½ tons, was used at each end for removing the debris; attached to this was a tender, consisting of two bogies, on which was carried an air reservoir of 650 cubic feet capacity. At the commencement of a journey the pressure in the reservoir was 6 to 7 atmospheres. After a train of 12 laden wagons was taken to the outside, a length of about 600 yards, the pressure was about 4½ atmospheres; on bringing the empty train in again the pressure in the reservoir was then 2 to 2½ atmospheres. In 1875 these were replaced by lighter and more efficient locomotives, in view of the great length that would eventually have to be run over before the completion of the undertaking—four miles or more at each end. These engines were similar to ordinary locomotives; the air reservoir, in place of the boiler, was of steel, 11 ft. 8 in. long by 5 ft. 7 in. diameter. At this time special compressors were being erected for charging the reservoirs with air of 14 atmospheres. Three locomotives were used at each end; gauge of road 1 metre. Each engine placed on four coupled wheels, 30 in. diameter, and had two cylinders 7·88 in. diameter by 14 in. stroke. The air was wire drawn, to give 45 lbs. per square inch effective pressure in the cylinders. Weight of engine about 7½ tons.

In September, 1878, the horses employed within the tunnel were 38 at the north end and 41 at the south end. In the same month 2117 workmen were employed within the tunnel at both ends and 923 outside = 3040 workmen at both ends.

In 1877 the air-pipes were renewed at each end, in order to obtain an increase of pressure, which had fallen to 2½ atmospheres and under. The 2⅝ in. pipes were replaced by 8 in. pipes. In November, 1878, the pipes were as follows:—

8 in. pipes=52·3 per cent.	2⅝ in. pipes=26·4 per cent.
6 ditto = 9·8 „	1 1-5 ditto = ·2 „
4 ditto =11·3 „	

About the middle of 1876 two new Girard turbines, with compressors, were erected at each end. Each turbine was 16 ft. 7 in. diameter on a horizontal shaft, working under a head of 240 ft.; water used per minute, 1016 cubic feet. At 70 revolutions per minute they gave 325-horse power at the shaft. From each turbine two compressors are worked by cranks and rods from the turbine shaft; each air pump is 27½ in. diameter by 35·4 in. stroke, the air being compressed to 8 atmospheres. In November, 1878, at the north end, the average pressure was 7·15 atmospheres at the entrance, and 4·33 atmospheres at the face. During three months ending September, 1878, the consumption of dynamite in the north end in 24 hours was 501 lbs.; in the south end, 553 lbs.=1054 lbs. in both ends. In 3¼ years ending November, 1878, the length driven at the north end was 6811 yards; at the south end, 6256 yards—10,067 yards in all, giving an average of 6·64 yards forward per day for both ends. But during the eleven months ending November, 1878, the average progress made per day was 7·5 yards per day in the two ends together, at which rate the headings continued to be driven until the holing was effected in February last.

A prominent feature in the mechanical arrangements is the extent to which water power, through the agency of turbines, was made available for compressing the air required for actuating the rock-drills and locomotives used in the tunnel. Not less than 30 air compressors must have been in operation at the two ends at the concluding period of excavation. The bell exhausters, described above, were also moved by water pressure. When we consider the great distance to which the compressed air was driven in the later stages of the undertaking—four miles or more to the front—there is no reason why water-power should not be made use of for a like object in the hilly mining districts of this country (as Cornwall and Wales), though this power has the drawback that it is liable to diminish to a degree below the requirements in dry seasons. I may add that according to a recent statement in a Berne Journal 150 persons have died and 400 have been disabled in the driving of this tunnel up to Feb. 28, 1880. This is stated to be the result of careful observations, though it is more than double the number given by most engineering papers at the time when the two tunnels met. C. E.

NOVA SCOTIAN MINING AFFAIRS.

SIR,—The Mines Department of Nova Scotia Annual Report has at length made its appearance, and those curious in such matters are now possessed of information which, however desirable, it was impossible to obtain at any time during the previous twelvemonth, even as to any part of that twelvemonth. At times it seems long to wait. Gold mining is nearly always and almost everywhere a somewhat impetuous sort of an occupation, noted for quick resolves founded upon tangible facts, and followed by alertness of action, and when one has to wait for a twelvemonth, or even for a large portion of a twelvemonth, to ascertain whether he can safely embark in mining ventures or not, he will not improbably get wearied, and turn his attention to some other business.

In former years it was the rule of the Mines Department to publish monthly and quarterly statistical tables embracing all the mining information that would probably be required concerning every district in the Province. This very useful method has long since been discontinued, and the fact has not tended to lessen the downward tendency of Nova Scotian mining interests. To avail ourselves of the information when and as provided for us, we find that the gold product—to commence with that—shows an increase over that of the last preceding year. That increase, however, is much less than was hoped and expected. Leaving out fractions of an ounce, the total gold yield for 1879 is only 13,801 ozs., against 12,557 ozs. in 1878. As long ago as in the year 1867 the annual product was 27,314 ozs., having shown a rapid increase during the previous four years. That of 1867 was the maximum yield. During the seven ensuing years the yearly product lessened, until it fell to 9140 ozs., since which time it has slightly fluctuated, and as we see is now only 13·801 ozs. This latest annual return shows no falling off in the rate of profit. You may probably remember the showing years ago that the gold mines of Nova Scotia yielded a larger profit proportionate to the capital invested in them and the labour expended on them than any others in the world. The product of 1879 shows a larger amount for each man employed in mining than any previous year has done, with one exception. So it cannot be any natural poverty in the Nova Scotian gold fields which makes them produce so small an aggregate. Neither can it be the expense of working them, for they are all in easily accessible situations, the price of labour is not high, and all requisite mining supplies are to be had upon the spot as cheaply as anywhere else in the world.

Why, then, does gold mining languish in Nova Scotia, as it must be admitted it certainly does? It is a significant fact that 1867, the year of Nova Scotia's largest yield of gold and very nearly the most profitable of all to each individual engaged in mining, was also the year in the very midst of which the original *regime* for the administration of mining affairs was radically changed. I do not here purpose going fully into a discussion of the causes of that languishment already mentioned, nor would probably such a discussion be very interesting to your readers, but I reasonably ask—Might not this change immediately account for all of the evil results of which we complain? Up to the year 1867 the Commissioner of Mines was supposed to be independent of political party changes in the province, to hold his office "during good behaviour," and to be an officer who really understood the affairs which he was set to administer. On July 1, 1867, that commissionership, absurdly combined with that of Public Works, became a departmental office, to be held by a member of the Provincial Administration holding a seat in the Provincial Legislature. The officer is consequently changed with every change in the Provincial Government. The office is merely the reward for political influence. Its occupant need know nothing of matters over which he is set to administer, and in truth, since 1867 none of them have even pretended to know anything theoretically or practically of what relates to mining in any of its branches. Upon all such matters they have been dependent, where real information was really desired, upon their subordinates or upon outsiders. With the head of the department thus open to the suspicion of having his decisions biased, whether wilfully or unintentionally, by political party considerations, with his subordinates open to charges—I do not say correctly—of corrupting influences of another kind, is it a cause for much wonder that people of experience have lost confidence in the mines department, and are slow in getting that confidence renewed? Still there are no sufficient reasons why people should refrain from investing in Nova Scotia gold mining ventures, for it must be remembered the Commissioner of Mines and all his subordinate officials, with the Provincial Government itself, are subject to the laws of the country just as other people are.

In coal, as in gold mining, the result of the past year's operations has been to most persons a disappointment. The whole coal sales for the year actually show a decrease upon the already largely reduced sales of 1878. The sales to the interior provinces of Canada (Quebec and Ontario) do indeed show an increase over those of the previous year, amounting to 154,118 tons, against 83,710 tons in 1878. There has also been a very slight improvement in the small shipments to Prince Edward Island and to Europe. On the other hand, there has been a small falling off even in the Nova Scotian home consumption, and a very material decrease in the sales to New Brunswick, Newfoundland, the West Indies, and the United States. The latter country was formerly the principal coal market of Nova Scotia, consuming more of that article than all our other customers combined. So long ago as in 1865 the shipments to that country amounted to 465,194 tons. In 1879 they amounted to only 51,641 tons, being less than the sales of any former year since 1849. It is difficult to conceive how there can be any improvement in this state of affairs whilst the trade relations generally of the two countries continue as at present. The merely nominal duty which Canada now imposes upon United States coal does not in the slightest degree impede a large annual importation of that mineral, especially by the inland provinces of the Dominion. The United States duty upon coal imports, on the other hand, acts almost as a prohibition upon the shipment thither of coal from Nova Scotia. Thus the Nova Scotia coal-owner is beset with embarrassments from which I do not see any very early prospect of his being relieved.

This Commissioner's report furnishes but little information concerning the iron mining and smelting of the past year, and no comparative statements are given. We merely learn that upwards of 32,000 tons of ore were raised, and I presume passed through the furnaces. Nothing worth mention has been done in copper mining. Other mines have been of little moment. Some sales of gold mines have lately been made to New York companies, and notwithstanding what is stated above, many persons anticipate a lively current year in gold mining. Iron mining will, no doubt, be brisk. GNOME.

Halifax, April 2.

OUR CANADIAN LETTER.

SIR,—Circumstances have prevented me from sending my usual letter for some time past, but now when mining is beginning to assume an appearance of interest, and when I see some real business enterprise becoming prevalent, I hope to be able to send you some interesting letters. The United States of America awoke from its depression like a "giant refreshed with wine," and the consequence has been that the mineral market in England became active. No doubt since November many people on your market must have made fortunes, and the good times are likely to continue could ignorance be dispersed, and, worse than ignorance, those demagogues who make their living by fooling the people and advocating strikes. Ever since the time Cleon rose to eminence as a demagogue and caused trouble at Athens, but particularly in our own time, the business of virulent, ignorant, false and cunning demagoguism has been a varying trade. It is much easier for a man to talk than to work. A great talker with nothing but the power of talk, *vox et præterea nihil*, starts forth from a band of workmen; he begins by making them dissatisfied with their wages; he talks and lectures, and talks till they start an "union," and make him the head of it, and give him a salary which is as much as he could make by hard work. Then he is happy; then he travels and puts on airs, and becomes the "people's champion," when he has done nothing but make his own class pay him for doing nothing. A strike follows, and the fanatics in other parts of the country send funds to keep the fanatics in his part of the country from starving. Then there is waste of time, waste of money, misery in families and deaths of infants—all in order that the "people's champion" may ride in a first-class car and talk large words about "freedom and the people's rights." How long this battle between labour and capital is to continue it is difficult to say, but as long as men can make money out of their fellow-workmen by talk and badger and foolery, so long will labour offer a grand field for unprincipled demagogues. We have had Mr. Parnell in America, but he found the American people were not so easily fooled as his native Irish. We were willing to give to suffering humanity, but when he talked about the "tyranny of landlords" the people of America could *not* see it. They could not see if a man owned a piece of land and wanted to let it why he should not take the highest bidder for the land, and if the bidder bid too high then more fool was the bidder. His talk was altogether too Irish for Americans, and they could not help laughing at his conclusions, particularly when they know that Canada offers 160 acres of fertile land that will produce 45 bushels of wheat to the acre for nothing, and that the United States offers the same quantity of land on the same terms, although the quality is not as good as the Canadian North-West. We could not see why those suffering Irish stayed in such a suffering country, and bid against each other for little bits of land out of which they could only gain scarcely existence. So the dissolution of Parliament was announced, and Parnell left "suffering humanity" to take care of itself, when he got the telegram in Montreal and started off hot-foot to look after his votes. Probably they will give him a banquet when he arrives, at which enough wine will be drunk to keep a dozen of his constituents from starvation, and then he will call upon Heaven to help them in his next speech. Nobody but an Irishman could be so inconsistent.

Thus one demagogue has left us, and we hope he will stay away, for we have enough of that class of people here. Since the "boom" took place and prices began to rise the labour strikes have become numerous. All through the Continent the workmen are striking, and seem to forget that materials have risen as well as the price of the manufactured article. I do not blame the workman for trying to get the worth of his labour; and if the price of the article goes up he thinks that he who has contributed to the making of the article and getting the price should secure more than when the price was low, but what I do blame the workman for is—*striking*. There is a very simple way of settling labour disputes, and that is this.—Let a company be formed for carrying on the works, and let the workman take shares in the company for the advanced price of his work. There is no need for striking. The workman would have a direct interest in the welfare of the company, and both employer and employees would work hand in hand together.

MINING IN CANADA.

The Madoc and Marmora Mines began to attract attention last fall. Madoc is a township about 10 miles square, lying 30 miles north of Belleville, on the Hastings road. Belleville is situated on the Bay of Quiente, and has within the last two or three years grown into a city. The building of the Grand Junction Railway, which is to connect the Grand Trunk at Belleville with the Midland at Peterborough, and which is finished at least as far as Stirling or Campbellford (from thence the North Hastings Railroad runs to Madoc), has had a great effect in increasing the prosperity of Belleville. In 1867, about 7 miles north of the village of Madoc, the Richardson Gold Mine was discovered. This was a curious combination of dolomite with pockets of fine gold embedded in rotten quartz or gossan. The amount of gold taken out was considerable, and probably the mine would have paid well, but some of the Belleville people got the matter all mixed up in a Chancery suit, and disgusted the capitalists, and so they left for pastures new. Richardson, the old farmer who owned the mine, was the only person who made anything out of it of importance, as he sold out for $45,000. Then in 1873 the depression came on, and in the fall of 1879 the "boom" burst, and so the people of the States were looking eagerly for mines and all kinds of business to put their surplus gold weekly imported from Europe. Thus it came to pass that the mines of this country are beginning to attract the attention of capitalists. Iron is also looking up. An iron deposit the other day, on the other side of the river from Brockville, was sold to a Cleveland firm—Messrs. Glidden and Hall—who are engaged in the iron business in that city. Opposite Brockville we have the little village of Morristown, and it is a perfect wonder to me that some enterprising man does not establish an iron smelting furnace there. They would be able to get their ore cheap; their labour cheap from Canada; their fuel cheap by means of the Utica and Black River Railroad; and their land for the works cheap. Then for a market they would have the market of the United States, the markets of Europe and Canada by the St. Lawrence River. I suppose the locality is not known to the people of the United States, for it is a small place, but possesses great advantages.

Brockville is 50 miles east of Kingston, 100 miles west of Montreal, and 70 miles south of Ottawa—all in round numbers. The Canada Central Railway here strikes the St. Lawrence, runs to Carleton Place, about 40 miles, where there is a branch to Ottawa city. From Carleton Place it goes straight north to Armprior on the Ottawa River, then it turns north-east, and runs up the south side of the Ottawa River to Pembroke, from Pembroke it runs to Mataman, from Mataman it is intended to run to Lake Nipissing; the Canada

Pacific coming from the west will strike the Canada Central at Lake Nipissing. The Canada Pacific will connect with the present section of the Canada Pacific at Fort William, on the north side of Lake Superior, about 900 miles west of Lake Nipissing. At present the Canada Pacific runs from Fort William to English River, 125 miles; from English River to Kewattan, about 200 miles, is under contract; from Kewattan to Winnipeg is nearly finished. Starting west from Winnipeg there is 100 miles under contract, and another 100 miles will soon be put under contract, which will bring the railway near Fort Ellice, an old Hudson Bay Company's fort. From Fort Ellice it will run in a north-easterly direction to Battleford, thence along the River Saskatchewan to Edmonton, thence to Jasper House, and crossing the Rocky Mountains will strike the British Columbia section somewhere near Kamloops, on the Thompson River. From Kamloops there is another section under contract to the vicinity of Fort Yale, and thence down the Fraser to Barnard's Inlet.

There is no reason why a great army of men should not be brought out from Ireland and put to work on the Canada Pacific. It would suit us much better to pay men their wages than to contribute for nothing to "suffering humanity" in the shape of Ireland having too many people and not knowing enough to scatter them. If a gardener had too many plants in his drills he would soon clear them out and put the plants in new soil, but the British Empire does not seem to know as much as a common gardener. BOURNONITE.

Brockville, Province of Ontario, March 18.

SPANISH THREE PER CENT. BONDS.

SIR,—In these days of speculation let me point to a *bona fide* investment apparently but little appreciated by the general public—I mean Spanish Three per Cent. Bonds. The 100*l.* bonds can now be purchased about 16 15-16ths, so that 5 per cent. is received on the investment, as the Spanish Government pay punctually 1 per cent. upon those bonds. There is, also, the prospect of the Spanish Government resuming payment at the rate of 3 per cent. This investment is really on a par with first-class investments, and merely, I believe, requires to be known to be better appreciated.

I may mention since the Ballymena and Larne Railway has been noticed in your columns the public have taken a greater interest in it, and the shares (10*l.*) of that neat little and well-conducted railway are commanding considerable attention in Belfast and its neighbourhood. LOOKER ON.

THE RUBY MINE.

SIR,—May I ask you to give publicity to the following facts, which may interest holders of Ruby shares? On April 14 a report was circulated on the Stock Exchange that something had been discovered to be wrong in the title to the property of the Ruby. Being interested in the mine I called at the office of the company and saw the chairman. He informed me that there was no ground whatever for the report. Without specifying individuals I may say that the result of the various enquiries which I made was to satisfy me that the origin and motive of the report was merely a craving in the stomach of a hungry "bear" for share-food at a cheaper rate than existing prices afforded. The mine never promised so well as it does at this time, and shareholders will do wisely in refusing credit to manufactured and unofficial reports whose object is not truth but sly self-interest.

April 15. "FOR ONE AND ALL."

THE RUBY HILL MINING DISTRICT.

SIR,—The subjoined extracts from the Eureka Daily Leader of yesterday will be interesting to a large number of readers of the *Mining Journal* who are connected with mines in the Eureka District of Nevada. There can be no doubt that the Richmond Mine is the richest ever seen in this part of the country, the ore extending down to three or four levels, with no sign of the end. The Dunderberg has also cut into a fine body of good ore, and as to the Eureka Consolidated Company's its value has not been at all overstated. Indeed there appears to be no end to the ore in the district, and it seems to get richer as depth is attained. HENRY PRIDEAUX

Ruby Hill, March 25

GOOD NEWS.—No pleasanter news could be given to our readers than that of a strike in the Eureka Consolidated. Although the mine has been yielding fairly it was known that the old bonanzas were about exhausted, and its future depended greatly upon the success of the prospecting work. We have it from an outside, but entirely reliable, source that most important developments have recently been made which promise a permanent supply of ore to the furnaces for some months to come. The ore body found is at a point directly above the incline, and between the eighth and ninth levels. This is to the eastward of the famous eighth and ninth levels' old bonanzas some hundred of feet, and in virgin ground, acres of unprospected territory existing in that neighbourhood. It is also directly underneath the old Shaw bonanza, where the cave occurred some years ago. A drift has been run into the ore some 50 ft., and it gives every evidence of rivaling the bonanzas that have already made the Eureka Consolidated such a fine property. This find is most important to the district, as the Eureka was the only prominent mine in which the prospects were not of the best. By many it was supposed that the closing down of the furnaces was something more than a temporary suspension; in fact, that the cessation of operations was a forced stoppage, and that they would not resume until time had been given to open out as yet, undiscovered deposits. Happily the recent discovery removes all doubt, and the Consolidated will continue to pay its dividends as regularly in the future as it has in the past.

ANOTHER STRIKE.—The Eureka Daily Leader of the same date says Mr. W. H. Taylor was in town to-day and was in high spirits. He has been at work developing the San José for several months past, and within the last few days has made a rich development in his mine. He brought in some rock literally bespangled with free gold. To show the value of the strike, he says that he is out over $1100 in this last effort to develope the mine, and has taken out ore enough in the last four days to more than repay him his whole outlay. We are probably wrong in saying anything about this matter, as it might have a tendency to start a boom, you know.

THE PANULCILLO COPPER COMPANY.

SIR,—The "Sanguine Shareholder" whose letter I find inserted in the Journal of April 10 is right. Panulcillo Copper shares are very low just now, and it has been all along my intention to direct renewed attention to them. But, with the Easter holidays and the general election on, with a reaction in every department of trade, I knew it was waste of time to do so. Nothing remained to be done but to await a better opportunity—a better chance of being heard—and such, I think, is now the case. The elections are practically over, the prospects of a stable Government for many years to come cannot be called in question even by the staunchest City Conservative. On the other hand, I believe, with many others, that we are at the end of the reactive movement in trade, and that an important rebound will take place so soon as the new Ministry is formed, and this has now been reduced to a question of days.

There, is, therefore, every occasion at present to call attention anew to such securities as are likely to benefit much by the coming rise in prices. That Panulcillo is foremost amongst those is, in my opinion, beyond dispute. After having been 6½ early in January they have now receded to 4½—a fall of 2*l.* in a few months, equal to about 30 per cent. For such a decline there is, of course, no reason whatever. It is out of all proportion to the reaction in copper prices, and can only be explained by the foolish action of holders who have been wilfully throwing their property away, thereby, perhaps, frightening others who intended to hold on. To show the utter absurdity of the recent fall in Panulcillo, it is only necessary to compare their market price (say) three months ago and to-day with the values of other foreign copper shares. In the middle of January (I take the quotations from the last page of the Journal for Jan. 17) Panulcillo were quoted 5⅞ to 5¾; New Quebrada, 4 to 4¼; Rio Tinto, 9⅞ to 10¼; Cape Copper, 38 to 40. To-day's prices of these shares are—Panulcillo, 4⅛ to 4⅜; New Quebrada, 3¾ to 4⅛; Rio Tinto, 12⅞ to 13⅛; and Cape Copper, 38 to 40. Therefore, while New Quebrada have remained stationary, Rio Tinto and Cape Copper (including the dividends) have risen considerably, and Panulcillo only have gone down 25s. It cannot, in the face of these figures, be denied that the fall in Panulcillo is both exceptional and unwarrantable, just as much as the rise in Rio Tinto shares from 10 to 13. I know the Rio Tinto directors have declared a dividend of 5 per cent., but whether the rise in the shares was cause or effect it is impossible for an outsider to conjecture. So much is certain, that had I shares in Rio Tinto I should sell out instantaneously after this declaration of dividend, and were I a bondholder I should move for an injunction at once to restrain the directors from dividing so-called "profits" in the teeth of a floating debt which at the end of 1878 amounted to nearly 1,500,000*l.* If the Panulcillo directors had followed up a similar policy of distributing dividends while saddling our property with fresh debts for a permanency 6 per cent. might easily have been divided for the last half-year, ending Dec. 31, or at the rate of 12 per cent. per annum. But it is their policy to pay off every penny of floating debt before dividing anything—a sound business-like course which should have been greeted with a rise in prices instead of a fall. The floating debt of Panulcillo has been gradually reduced from 60,000*l.* to 7000*l.*, and now it is on the point of being wiped off, when the shareholders will get the full benefit of all the net profits. Considering that these were for the last half-year about 15,000*l.*, or at the rate of 30,000*l.* per annum, which must be considered a minimum, there is no reason to be downcast. The present market price is simply ridiculous, especially when compared with Rio Tinto, and I would, therefore, advise *bona fide* shareholders not to sell on any account. Before long Panulcillo must at least regain their old level of 6½.

April 14. A PERMANENT SHAREHOLDER.

ALMADA AND TIRITO CONSOLIDATED MINING COMPANY.

SIR,—These shares appear to be meeting with attention, as there seems to have been a great improvement during the last month, and the present price is very low. According to the telegram just received the produce since Jan. 1 is $45,000. It appeared from the telegram received on March 25 that the produce was increasing a little, as the yield for the last week in December was $2044, but that for the last week in February was $3250, being an increase of 50 per cent., but since then the increase has been more marked still. According to the telegram just to hand the produce since January 1 is $45,000. The produce for January was $12,180; February, $11,615; so that for the month of March the produce was $21,205: making since Jan. 1, $45,000. Yet the shares are only 7s. 6d. to 12s. 6d., although they are earning a profit. B. B.

April 15.

FLAGSTAFF SILVER MINING COMPANY OF UTAH.

SIR,—It is only fair in all cases in which there is dispute, and whenever statements are put forward as facts which are not only very doubtful but entire misrepresentations, that both sides of the question should be thoroughly discoursed upon before any opinion is either given or offered; but in the case of this unfortunate company so many different versions of its affairs have been communicated to you that no wonder Mr. Pearson commences his letter, which appeared in your valuable Journal of last Saturday, by complaining that there seems to be great difficulty in making known (or, as he should have said, making people believe) that he was the sole representative and agent of the American Mining Company; but he must pardon me if I dispute the correctness of his expression "the mines which for some time were supposed to be the property of the Flagstaff Company." Considering the knowledge he must possess of the company's affairs, he having formerly been a director of the same, this expression is somewhat extraordinary; but it will far exceed the limits of a letter to now narrate the manner in which the company has been deprived of the use of its property. I have on more than occasion given the explanation; suffice it to say, that the company still has a voice in the final disposition or surrender of the same, which, as I stated in my letter which appeared in your Journal of the 3rd instant, "that a clear title can by the acquiescene of the company be obtained, which acquiescence would, no doubt, be given in the case of the shareholders being equitably dealt with;" but the plan or scheme of Mr. E. Pearson, to which I shall refer later on, does not by any means propose to do this.

It is rather unfortunate that Mr. Pearson should refer to a circumstance which is not only disputable but exposes him to severe criticism. He states that it is now more than two years since he exerted himself to secure to the share and debenture holders the opportunity of purchasing the properties "under such good and clear titles as the various owners were in a position to give." Now, the first scheme proposed was one of reconstruction, submitted by a member of the late committee of shareholders; but in certain respects it was held not to be acceptable. Shortly afterwards two of the then directors contemplated a plan, and about the same time Mr. Pearson's appeared; but at that time it was impossible to submit any scheme for reconstruction or reorganisation to the shareholders, inasmuch as the two important litigation suits—the Tarbet and Davis—were then still under appeal, and the decisions were only given in the former suit in May, and in the latter suit in June, of last year, for had the decisions been given reversely to what they were—that is to say, if the Tarbet decision had been given in favour of the company, and the Davis decision against the company—it would have entirely quashed any scheme or plan which might have been adopted, and, therefore, no one could have given a good title to the property until these decisions had been given. Mr. Pearson was not, therefore, correct in stating that he "submitted a plan by which the property might be acquired from the liabilities and litigations of the company."

When he speaks of his "persistent recommendation of a liquidation," does he wish your readers to infer that he recommended a voluntary liquidation? If by putting a petition on the file to wind up the company compulsorily, and keeping it there for a year and a half, and thereby reducing the price of the shares to almost *nil*, is not hostility to the shareholders, I fail to understand what is. However, I need not go further into that matter now. It was fully discussed through the medium of your Journal last November and December. Although the company has been lingering for some time past it is not dead yet. It is to the interest of the shareholders that it should be kept alive as long as possible. It is quite true that Mr. Pearson has been trying for more than a year to form a syndicate, but has not succeeded, and I have been informed that he went to Scotland to try and induce the members of the syndicate already formed to work with him, but that he had to return without in any way accomplishing his object. He seems to take it for granted that because the vendors have put up their price that they are to get it. Now, it is well known that a much less sum will suffice for the purchase than that named, and notwithstanding this he put forward a scheme or plan on this basis which he seems to expect the shareholders of the present company will accept. He refers to the high price to which the shares have lately advanced as a reason of the vendors increasing their price. This he must know to be a fallacy, as the company—as matters now stand—has no assets. As a matter of fact the price of the shares is regulated principally by the amount of confidence felt by the shareholders and the public in the syndicate; but as Mr. Pearson is not now a shareholder (having availed himself of the enhanced price to clear out) it must be a matter of indifference to him as to what amount the shares of the new company should be. I for one being a rather large shareholder object to Mr. Pearson, or any other non-shareholder, dictating as to the terms upon which the shareholders are to be treated hereafter. I fancy I know what my co-shareholders will think of a proposition to give them the half of a 1*l.* share in lieu of a fully paid-up 10*l.* share.

Mr. Pearson further states that the owners have specified that the capital of the new company is not to exceed 130,000*l.* Now I am in a position to state that the contemplated new company will have a capital of 150,000*l.* divided into shares of 3*l.* each, 30,000 of which will be offered to the old Flagstaff holders on payment of a small sum, in no case exceeding 5s. per share. This arrangement will no doubt be far more acceptable to the shareholders than the rather surprising proposition of Mr. Pearson. The remaining 20,000 shares will be sufficient to pay the purchase money, the debentures, provide a working capital, and create a reserve fund. Thus you will observe that the shareholders will obtain an important material benefit under the new arrangement. As the mines are in good working order a sum even less than one-half that mentioned by Mr. Pearson would be ample for working capital. He is labouring under one very great disadvantage—that whilst he is virtually unsupported in his plan a sum nearly sufficient for the purchase money has already been subscribed by the members of the syndicate who have consented to receive their money back in shares issued at a large premium. Perhaps the most startling part of Mr. Pearson's communication is the closing paragraph, in which he would make it appear that the capital required by the syndicate programme is 254,000*l.* I do not wish to comment upon his use of figures in this instance, but the way he works up to that sum would be—to use his own words—"demonstrably absurd" were it not that the process by which he reaches the result is evidently absurd. A few days will, I trust, suffice to put the shareholders in possession of more light upon the above most important points, and from a more satisfactory source than that of your humble servant.—*Great Winchester-street, April* 15. A. A. DE METZ.

MINING PURSUITS.

SIR,—Expectation is waiting for the new wave of prosperity to come upon us. The elections are now about over, and as the incoming Government can count upon a working majority, with the restraints which responsidility thrusts upon them, and an ever compact and watchful Opposition, we may fairly look forward to the commercial interests of the country being well looked after, and an expansion of trade. He who would succeed in mining must venture—to win, and choose his metal. Gold has had a run; silver not left out; whilst tin and copper have made their mark; but in lead there is room for a great rise, but the shares of dividend and progressive mines are much below their intrinsic value. Let investors, therefore, wait not for the rush, but select whilst the stream runs on its placid course, not waiting till the full pressure is put on. It is always well to avoid companies who show no sign of life, but go on in a humdrum existence of apathetic dreaming. One of your able correspondents speaks of the tons per fathom drummed into the ears; let investors, however, form their own conclusions, and believe just a little, not forgetting, however, that no band is good without a little drum. In all healthy society there must be activity; so in mining pursuits—prominent companies advance, whilst reticent ones decay. Let not, therefore, selfish contumacy deny its tribute to the energetic miner. There are fresh pastures waiting for him. I ask the coming investor to read the ample reports which appear in the Journal on the progress of different mines, and whilst avoiding extravagances to pause before entering into concerns which keep their goodness to themselves, and appear only occasionally when more capital is wanted, and then disappear with their victims—like the famed man-eating tree.

London, April 13. OBSERVER.

TIN SALES BY TICKETING.

SIR,—The mode of selling tin ores is undoubtedly still occupying the attention of many who are interested in the welfare of Cornish tin mining. The subject was introduced by Capt. Teague, who is and has been for some years past an extensive proprietor in two largely producing tin mines, besides having sole control of them. But I would ask—Can Capt. Teague sell the produce of his mines at a fair market price to other smelters when his firm is not prepared to take what he has to sell? In such a case which recently occurred the smelters, as wise men, took the sound view of the position, and reduced the standard 3*l.* at once, showing a true perception of what was intended. Notwithstanding the deliveries for the 14 days of April are 585 tons, yet the price has receded 9*l.* per ton within 14 days. Through whom? If this be so, the time has arrived when the shareholders in certain mines should ask the question—Are our interests identical with smelters, metal brokers, or unscrupulous operators in the metal market? Nothing was ever more inimical to our interests than this pretended attempt at reform. MINER.

April 14.

COPPER MINES.

SIR,—I have just been looking up your remarks for some weeks past on the Copper Market, which in the main commend themselves to my own judgment, as I have no doubt they have done to many others, for the sound and really practical view they give of the past, present, and future condition of the markets affecting this most important branch of commercial enterprise. The inferences I have drawn from a perusal of those remarks and from my own observation in other directions are these—that (to use a commonplace illustration) we are rousing up from a long and sluggish sleep of depression, the little reaction and activity which we experienced at the commencement of the year being only like a preliminary yawn and stretch, followed by a slumbering relapse (now taking place), from which we shall spring into such a life of activity and business as we have not had the chance of knowing for many years past. It will be well, therefore, for each of us who are already alive to the busy prospects before us to take an early scan of the horizon of the mercantile world with the view of ascertaining in which direction we shall be most successful. I have done this for myself, and have come to this conclusion, that to invest in good sound copper mines at the present time will turn out the most profitable transaction any capitalist (either large or small) can embark in. The relapse which has taken place recently might be treated in reality as little better than a "bear," for when we consider the statistics of the copper market and examine minutely the imports, production, consumption and stocks in hand, we shall find that the stocks in hand are very materially reducing. What does that mean? Why, that the consumption is greater than the production; and such a condition of affairs can only have one result, which I have little hesitation in saying we shall all see in a very short time—viz. an immense rise in the price of copper, and, as a consequence, a similar rise in value of the copper producing mines.

I see so much in your Journal of writing up special mines for "special" purposes that I will not give you the list of mines that I consider good for investing in, but leave your readers to use their own discretion in selecting such mines as they may consider best to bring about a profitable investment. I might, however, without fear of attaching myself to that "special" class of writers, mention as certain and safe investments Devon Great Consols and Wheal Crebor for dividends, and as prospective mines I should certainly give preference to East Caradon and Parys Corporation. But, as I before stated, your readers must use their own judgment in the selection of investments. If I have added anything to confirm your observations respecting the copper markets I shall be very well satisfied to leave your readers to judge for themselves how far my remarks are to be accepted, or whether they will avail themselves of the present opportunity of improving their pecuniary condition or otherwise.

April 15. OBSERVER.

THE MICROPHONE FOR COLLIERIES.

SIR,—Although I have frequently pointed out the objections to the introduction of electricity as a means of signalling in mines, the observations which I have made do not I think apply to the telephone or microphone used as a supplementary means of safety, inasmuch as the microphone does not necessitate the use of a battery, and has little to get out of order, and assuming the microphone to be admissible I think that of Mr. De Locht, of Liége, a civil engineer of considerable reputation to be one of the best that could be adopted. It consists of a very thin but rigid wooden, metal, or other "planchette" board or plate, of which the form and dimensions, so long as they are sufficiently spread out, can be otherwise varied. Its form is usually that of a rectangle of six centimetres of base upon five of height. Its thickness is two millimetres. This planchette is movable round one of its edges as an axis, and for this purpose at the two extremities of this edge are arranged two small metal straps in which the points of two metallic screws engage fixed by their supports upon the main board. At the part opposed to the axis of suspension is attached a prism of dogwood charcoal, of graphite, of graphitic carbon, or of any other mediocre conductor of electricity. Upon the anterior face of this prism are held by means of metallic flexible springs fixed upon the main board one, two, or more little fragments of graphite, of graphitic carbon, or of any other similar matter. These metallic springs can be straight or spiral, their tension is regulated by the aid of a screw. These springs are preferably sheet brass soldered to their supports by one of their extremities being traversed about a centimetre from that extremity by a screw, which turning in a tapped nut in the support determines the movement of the spring in one direction or another.

The movements of a planchette, limited in one direction by the springs and their extremities in graphite, are limited in the other direction by the pressure of an antagonistic spring, which can be regulated at will. A long flat spring is sometimes used for the purpose, fastened by one of its extremities to the main board, the other free extremity pressing itself upon the planchette while a screw turning in a nut soldered at a centimetre from the extremity of the spring regulates the movements of the said spring. The planchette in its normal condition is arranged in a vertical position of unstable equilibrium. Instead of being moveable about one of its edges the planchette can be fixed to the extremity of a vertical rigid trunk which has for its function the elongating of the arm of the lever of the movable apparatus. In another disposition the planchette is parted at its lower part by a metallic point plunged into a metal sheath, it carries at its upper part two fragments of graphite or other like material of little conductivity movable in supports of the same material, the position of which can be regulated by springs in the same way as the position of the planchette. The sensitiveness of the apparatus can be increased for the transmission of feeble sounds by placing an ear trumpet before the planchette.

The microphone planchette is introduced into the circuit of a voltaic battery containing the telephonic receivers, or into the primary circuit of an induction coil attached to the voltaic battery; the secondary circuit of the coil containing the telephones. The current traverses the microphone by going through the metallic conductor to the prism of graphite onward to the springs and to other conductors, or through the springs exclusively, the prism of graphite forming the conducting connection between them in such a manner that the current entering by the metallic conductor and the left spring traverses the prism of graphite and goes out by the right spring of the metallic conductor. The multiplying microphone-planchette disposes upon the same voltaic circuit (or upon many circuits tied to one or many telephonic lines) several microphonic-planchettes placed side by side in one or many ranges, they can be adopted upon a single main board of sufficient dimensions. These planchettes receive synchronously the impulsions of sound, transmitting them synchronously in such manner as to propagate them in many directions simultaneously, or to increase them and render them more distinct in a single receiving apparatus.

Now, I would not propose that these microphones should replace any of the signalling arrangements at present in use, but they might be placed in every pit, and the communication extended to all the principal working places, so that in the event of accident of any kind verbal communication could be at once established between the pit bottom or even the outside of the pit and the persons in danger. The cost of the apparatus would not be large, and I feel sure that all will admit that with an arrangement in working order much of the difficulty and loss of time now complained of in getting the men out of the pit would be avoided.—*Brussels, April* 14. INVENTOR.

SPENCE'S PATENT METAL.

SIR,—In answer to a great number of enquiries sent to the newspapers, to Belvedere, and to Dr. Cole, I beg to inform you that I have appointed my firm, Messrs. J. Berger Spence and Co., Lombard-street, my sole agents for the sale of the Spence's Patent Metal.

London, April 13. ——— J. BERGER SPENCE.

PRINCE OF WALES—SOUTH PRINCE OF WALES.

SIR,—With reference to the remarks of Messrs. Watson Brothers in last week's Journal, we are glad to say that we quite agree with those gentlemen in thinking that past experience has proved a good copper lode to run through the Prince of Wales sett. The word "discoveries" in the South Prince of Wales prospectus had reference to the prospect of further paying shoots of ore being found in the lode, and in this sense (which is the usual one) the expression was strictly correct. As regards silver, we can quite understand Messrs. Watson Brothers' objection to prosecuting a search, seeing that the Wheal Brothers lode passes at a shallow depth out of the boundaries of the Prince of Wales Mine, and enters the South Prince of Wales, so that the latter mine would in all probability benefit by the expenditure incurred by the former.

London, April 15. ——— STUART AND CO.

SOUTH PENSTRUTHAL MINING COMPANY.

SIR,—A letter in last week's Journal might lead to the supposition that the committee had allowed a certain latitude to some in respect of the payment of the first call. This is not a fact; only a small fractional part of the call is unpaid, and unless the two or three names in arrear pay at once they become liable to the usual consequences.

London, April 13. ——— E. ASHMEAD, Secretary.

DEVON COPPER AND BLENDE.

SIR,—I have read the letter of "A Late Mine Manager" as to our property, in last week's Journal, and I want to add two or three facts to it, which the writer should have mentioned. The Devon Great Consols Mine gave to the shareholders a profit of 11,000*l.* in one year above the back of the 28 fm. level, why should not we do the same? The copper ore in our mine has not been touched above the 26 fm. level, which is the adit level. The water will soon be out, and five or six men set to work on tribute, working the stopes. I have been underground myself in the adit, and I believe there is a mass of ore above just like there was in Devon Great Consols. A MINER.

Tavistock, April 14. ———

THE MINES OF CARDIGANSHIRE.

SIR,—The heat of a contested election being over, we are again at liberty to look round us at the prevailing stagnation of the once flourishing mines of this county. Of all the mines once in full work, the number at present paying can be counted on one's fingers; and there is really no reason for this, save it be in the fact that so many worthless concerns have been puffed off on the public that now legitimate undertakings cannot obtain capital. Anyone who has studied the glaring reports and unprincipled statements that have been published in all sorts of circulars for the last few years in connection with several mines in the county, and compare the flaming promises with the actual dividends, which are *nil*, will not be at a loss to account for the reason why Cardiganshire mining is at so low an ebb. An era of general prosperity and commercial activity has now undoubtedly set in, and attention may be drawn to mining enterprise in this county, which undoubtedly is well worthy of it, as the mines are not by any means worked out; far from it, few, if any, of them have attained any but very shallow depths, and past returns show that the county was hardly second to any in the United Kingdom as a lead producing district. The public will, however, do well to avoid glaring prospectuses, with scores of thousands of pounds capital, which principally goes into the pockets of London promoters, and support more modest and promising concerns. As an instance of what can be done, the Lisburne Mines, with 400 shares of 18*l.* 10s. paid, have paid per share upwards of 600*l.*, and there is no doubt the old adage applies most aptly here, that "there are as good fish in the sea as ever came out of it." X. X. X.

SOUTH CAMBRIAN MINES, CARDIGANSHIRE.

SIR,—Having found time during the lull in business in London produced by the excitement of the elections I took the opportunity of a run into Cardiganshire to enjoy the health-giving sea and mountain breezes of Aberystwith, and the hills adjacent and running up to Plynlimmon, and remembering that I had once been on the point of taking a considerable interest in the South Cambrian Mines, and had been deterred by seeing a communication in the Journal of March 22 last year "that the writer would venture to assert that he could find room in the British Museum for any mineral found in these mines." With so startling a statement before me I at once buttoned up my pockets, thankful to be saved from a loss. However, now finding myself in the neighbourhood, I determined upon a visit to my old love, and having called upon my esteemed and valued friend (Capt. Absalom Francis, of Goginan, whom I was glad to find in good health, and with his vigorous intellect sharpened by experience and age) we together visited these mines. You may judge of my surprise when instead of finding a poor barren mine as I at all events expected to see, without roads, without machinery, and without prospects, I found a mine teeming with every visible sign of wealth and future prosperity. A good road and stone bridge, a new 40-ft. water-wheel and 30-in. crushers, picking-floors, jiggers, and dressing machinery rapidly approaching completion, with a good railway to the adit, and the most complete imaginable buildings, including smythy, joiners' shop, stable, cart house, warehouse, barracks for the men, and residence for the captain and manager of the mine, Capt. Andrew Williams, who most courteously entertained us, and took us over the works.

Instead of finding a barren mine we found in the deep adit a course of blende, with 25 fms. of cover laid bare for 50 fms., and after that a course of lead 8 fms., with a back or cover of 30 fms., and after that a course of about 10 fms. of exceedingly rich malachite and black and grey copper ore; as estimated by Capt. Francis the black yielding 60 or 70 per cent. of pure copper, and the grey and malachite from 5 to 50 per cent. (all ready for stoping). There was also an engine-shaft sunk to the deep adit, and a winze sunk about 6 fms. deep below the adit was producing rich silver-lead. After passing these, and going to the forebreast, we found the men were cross-cutting into a course of gossan, as Capt. Francis stated, the finest and richest he ever beheld, and which he said never did and never could fail to produce at a very small depth immense quantities first of copper and then of lead ores, and he fearlessly asserted that he had not seen such prospects for an abundance of success as those presented in the South Cambrian Mines. Although myself disappointed I was pleased to see that someone had had the spirit to carry on a work of this magnitude through the evil commercial times now happily gone by, as we all hope never to return, and upon enquiry I found that this had been accomplished in true Lancashire style by two brothers—Mr. Samuel Stringer, a retired solicitor of Manchester, and Mr. John Stringer, J.P., of Macclesfield, who in the midst of the bad times, when shares in progressive mines were unsaleable, carried on the works at their own private expense, and have brought them to their present successful issue, and I can tell your correspondent of March 22, 1879, that it will require a very large room to hold the piles of lead, blende, and copper I saw at surface at the South Cambrian Mines, saying nothing of that ready for stoping, and it is always wise to pause before condemning or traducing an undertaking where the interests of others are concerned.

Richmond, April 12. ——— H. BUCKLEY.

A MODEL MINE.

SIR,—On the way from the village of Bugle towards Bodmin—about two miles from the former place—there is a little mine having the appearance of antiquity; but about 30 years ago a rotary engine for pumping and stamping was erected on it on the left-hand side, and close by the (late) turnpike road. The manager, a Londoner—now in America—applied to it the name of the Model Mine, because he laid out everything in a style which he thought was deserving of imitation. I remember that the engine-house and other erections were very well executed. But I think that the designer was disappointed in the result, for after a temporary working, either for want of capital or metallic mineral, the operations ceased. I believe that he meant the word "model" to apply to the character of the mine, as well as to the surface work, and he was much annoyed, I dare say, to have to yield up the pursuit without a realisation of his idea of a "model mine" in the returns. For several years his name was dropped from the *Mining Journal*, where he had been a frequent correspondent, and is now again, though he lives in the New World. It is more common—or has been—to erect model buildings on the surface of a mine than to get at riches beneath. At Wheal Vor, for the last working, everything was laid out on the "model" principle—engine, houses, &c.; but the company lost in their speculation a quarter of a million sterling. The previous company gained 272,000*l.* At Crane, in Camborne, many hundreds of pounds were expended in buildings (which the lord afterwards sold), without raising, I believe, any mineral for the market. I like such models in regard to results as you will find in Dolcoath, Tincroft, East Pool, South Condurrow, Wheal Peevor, South Caradon, and last, not least, Wheal Eliza. If any man wishes to see a perfect model in all the arrangements connected with raising, stamping, and dressing tin he had better pay a visit to Wheal Eliza, near St. Austell, where Mr. R. H. Williams, C.E., has apparently brought everything to the acme of perfection.—*Truro, April* 15. ——— R. SYMONS.

LLYN-Y-GADAIR SLATE QUARRIES.

SIR,—I observe with considerable interest the reference made to the above property in your valuable Journal of Saturday last by Mr. J. Grant Maclean, of Stirling. The discoveries of slate-rock lately made in this extensive property in ordinary times would have created a great sensation amongst the Carnarvonshire quarry proprietors, as judging from the various reports made by the most eminent authorities in matters of this kind from personal inspection shows that no such valuable discovery of slate-rock has been made in the Principality for the last half-century. The importance of this discovery is greatly enhanced on account of the facility the locality gives for working and transit conveniences. The North Wales Narrow-gauge Railway runs within a few hundred yards of the works at Rhyd Ddu, about midway between Beddgelert and Carnarvon. There is ample water-power always available on the grounds for all purposes, and the contours of the quarry site afford extraordinary facilities for the most extensive as well as cheap and rapid development. The homogeneity of the slate-rock throughout the vein, which is reported to be 120 yards wide, is said to be such as to render it almost one mass of pure slate-rock. This slate vein has not yet been thoroughly opened, but a parallel one of only about 70 yards wide has yielded results such as have never it is said before been realised under similar circumstances. This important quarry estate belongs by lease to Messrs. John Newman and Co., of Kettering, who have already expended about 7000*l.* in the development of the latter vein of slate.

The recent discovery of the much more extensive vein above referred to has determined them to seek the aid of capitalists in the further and more extensive development of these important discoveries. As times and the slate trade improve they will have no difficulty in getting all the co-operation they require. They have obtained the best possible advice regarding the value of the property, and for the future working of the quarries. Among the opinions obtained are the following well-known authorities:—Mr. John Paull, of the Llangollen Slab and Slate Quarry; Mr. Edmund Spargo, the well known engineer, quarry, and mine proprietor, of Bangor, a gentleman who has, probably, more or less some knowledge of every slate quarry in the Principality; also Mr. Owen, manager of the Dorottua Quarry, and several other practical quarry agents. The various architects, builders, and contractors who have purchased slates from this quarry, although they were obtained only a few yards below the surface, all bear the strongest testimony to their excellent quality. Those interested in the slate trade or slate quarries will do well to visit this property, or send to the owners, Messrs. J. Newman, for descriptive particulars thereof. The slate trade is, undoubtedly, improving, and will ere long, it is hoped, be as good as ever. The most prosperous and favourite quarry investments in North Wales just now are the Granite Sett Quarries, in operation in the mountains overhanging Carnarvon Bay. The Nevin Granite Quarry Company, and also the West Nant Quarries, are being extensively opened, and are destined to be classed ere long with the other great quarries in their vicinity. AN OBSERVER.

THEN AND NOW—No. II.

SIR,—In the Journal of Dec. 27 you did me the favour to insert my letter under this title, and I think anyone who will take the trouble to refer to it will fully justify me in considering the present time opportune for continuing the subject. I pointed out in the letter referred to the consequences of over-speculation in any one direction, and more particularly in foreign lands, and I also called attention to the vast fields which our own country offered for solid and lucrative mining investments. In the Journal of March 6 you inserted an extract from the City Press relative to the South Indian gold mines, a part of which is as follows:—"Crowds of people waited at the London and County Bank to present their forms of application, and the scene of excitement continued the whole of Monday. The prospectuses containing the necessary form of application for shares were sold for 5s. and 10s. each."

Some 30 years ago a yellow or gold fever raged on the Western Pacific Coast, and California sprung into notoriety. Australia followed suit, and private enterprise was more in fashion than corporate bodies. Lawlessness in its worst forms drove legitimate adventurers from the field, and the spasmodic action of the epidemic passed away. The gold fever may lay for awhile in abeyance, but it is never quite extinguished. It broke out soon again in Brazil, and thanks to the wisdom of our Legislature limited liability proved an admirable auxiliary to the spread of the contagion, and Anglo-Brazilian, Taquaril, and kindred companies made a large hole in the pockets of a too confiding class of investors.

It is not, again, so long since we had the white metal fever raging with unparalleled fury, and Nevada was parceled out in small garden lots to suit the ravenous greed of the grasping Britishers for silver. The game was well and successfully played, and Cousin Jonathan smiled in self-contentment. Now I suppose India will come to the front, and, heedless of the mineral treasures within our own land, regardless of the special claims of the mining, labour community, and negligent of our true interests, and our richly endowed land, we will with returning prosperity, and while enjoying the quiet which a wise administration will have secured us, rush in mad haste and frenzy into the last gilded bubble, and live in dreams of untold wealth until the vision is dispelled by the reality of loss.

We are, no doubt, going to play the same old game. Indian Gold shares are the mania of the day. I do not doubt for one moment the capability of India to supply a vast amount of gold, of which there is by no means too much at present for trade requirements; but I do object to an idiotic rush for shares in any enterprise having the words India and Gold as part of its titles, and creating an extravagant premium out of nothing for these shares. In Glenrock the directors had 67,000 shares at their disposal, and applications for nearly 700,000, the major part being from Scotland. If the canny Scotchmen who were disappointed in an allotment would but put their money into such enterprises as Bwlch United, Frongoch, South Darren, Tankerville, Roman Gravels, and others I might mention, they might better serve themselves and the country at the same time.—29, *Bishopsgate-street, London, April* 14. W. B. COBB.

[ADVERTISEMENT.]

EAST CARADON AND MARKE VALLEY MINES.

SIR,—The following remarks, by Mr. Joseph Hill, of Southampton, surveyor, relate to the recent rise in the price of iron, tin, copper, lead, and silver, and to the probable effects on mining shares and mining companies, merchants, speculators, and general dealers in metals:—

It is well known that the prices of metals were at their lowest in September last, and for some time previously I had been considering the probable effect of the reduced prices, and have been watching the market. I have taken advantage of opportunities, and have paid great attention to the business of two copper mines in Cornwall—the East Caradon and Marke Valley—in each of which I have been a shareholder for several years, and during that period I have become well acquainted with many of the adventurers, the committee of management, the secretary, and the captains of these two mines. It should be generally known that the two mines referred to have been since their commencement under the management of a committee at Salisbury, at which place during the whole period the meetings of the committee and adventurers have been held.

The remarks I am about to make are principally relative to the East Caradon Mine, which immediately adjoins the far-famed South Caradon, which for a long period has produced a larger quantity of very rich copper ore than any other mine in Devon or Cornwall, and one great object of the East Caradon adventurers for several years has been by sinking and driving to cut the South Caradon lodes, which, according to the opinions of those competent to judge, will be found not far distant. To reach this point many calls have been made, wearing out the patience and emptying the pockets of the adventurers, and at a general meeting at Salisbury on May 7, 1878, some difference of opinion was expressed as to what should be done, more than one talking of opposing the making of any further call, winding up, or selling their shares, particularly one who held 135 shares, which I purchased, and the vendor referred to then ceased to be a shareholder. I proposed making a call for vigorously continuing the sinking of the shaft, and though the bearing down of the shares was effectually continued up to the latter end of September or the beginning of October, 1879, I may venture to state that the proceedings at the meeting in May, 1878, will be advantageous to the undertaking. I find that the London brokers generally and a few of the adventurers are beginning to see clearly that the large expenditure has taken the shaft down so low as to be near one of the South Caradon lodes, which, when reached, it is believed will make the shares exceedingly valuable.

The effect of the panic on Southampton shareholders has been to cause one—a J.P.—to sell all his shares at 5s. per share; another—a town councillor—to sell his at 6s. per share; and many others have sold at a great sacrifice, and they must all feel grieved that those who purchased in September or October can now obtain at least 3*l.* per share, the market value having in about four months advanced from about 5s. to about 3*l.* per share. It appears that lately the London brokers and dealers generally have been considering the merits of the East Caradon Mine, and from several of their publications there seems to be a unanimous opinion in recommending the same to their clients, with strong reasons for doing so, in proof of which I made the following extracts from papers published in September, November, and December, 1879:—

From the *Mining Journal*, Sept. 13, 1879:—Henry Gould Sharp declares that he was a buyer of 500 East Caradon shares, and reported that an important improvement was coming off in the East Caradon Mine, and he would not be surprised to see shares 5*l.* each within three months, and much higher next year. He adds that shares were done at 7s. 6d. on Thursday, Sept. 12, and rose to 30s. each per share on Friday, Sept. 13, and he says the shares are well held in good hands, and are worth attention at 30s. to 35s. per share.

Sept. 13, 1879.—Messrs. Watson Brothers say as follows:—That astute and elaborate writer the agent of Tankerville—Captain Waters—reminded us in his last report of that property that in regard to successful mines, as in other things, "history repeats itself." He said—"Seasons come in cycles, history in epochs, which are ever and anon repeated," &c. This poetical way of putting the matter set us thinking what a practical illustration of it there is at present in the market. Up to the year 1859 there was a mine in 6144 shares, which had worn out the patience of many of its shareholders. So had Crebor in 1879. East Caradon, to which we refer, adjoined a very rich mine: so does Crebor. East Caradon shares were offered in the market for a few pence; we bought them just before the lode was cut at 1s. 6d. per share. So we did Crebor. When the caunter lode was cut at East Caradon shares rose, and the "bears" became active. So they also became in Crebor. At East Caradon "bulls" and "bears" sent their agents weekly to inspect the mine, and all sorts of reports were circulated to frighten people out of their shares. Thus also has it been in Crebor. The agent of East Caradon—Captain Seccombe—was a good practical miner, and an honest man. So is Captain Andrews, of Wheal Crebor. Captain Seccombe kept us regularly posted up as regarded the true position of his mine every week. So does Captain Andrews. We gave the public the benefit of all the information thus obtained in 1859 in the columns of the *Mining Journal* week by week. So we have as regards Wheal Crebor. The "bulls" of East Caradon applauded, and the "bears" fearfully reviled us. So they have in Crebor in 1879. Thus far has history repeated itself, our readers will admit, in a very extraordinary manner. And it is more than probable that one gentleman at least will read these remarks to whom we sold shares in East Caradon at 1s. 6d., and afterwards offered him 50*l.* per share for them, which he refused. The price of copper is not so good now as it was then, but at no time during the brilliant career of East Caradon was the lode so rich (20 tons per fathom) as the new lode now is in Crebor, and if the price of ore is less the cost of working Crebor by water-power is one-fourth less than it was by steam at East Caradon. . . . East Caradon, to which we clung against all evil reports, as we have to Crebor, paid its first dividend in 1860. Crebor "will repeat this part of history" in 1880. In 1861 East Caradon paid 8448*l.* profit; in 1862, 20,736*l.* profit; in 1863, 19,555*l.* 4s.—thus in three years from the discovery paying 83,546*l.*, or 13*l.* 12s. per share on the 1s. 6d. shares. It will be too much to say that with the present price of copper Crebor will repeat this, but this we do say, and fearlessly, that in 1880 Crebor will pay as good dividends and a higher percentage on present price of shares than any tin, copper, or lead mine in Devon and Cornwall. It is also a remarkable thing, we may add, that the discovery at East Caradon was on a caunter lode—that is, a lode running in a contrary direction to the usual run of copper lodes east and west. So also is the new lode at Crebor—a lode never seen or heard of in the mine till a few weeks ago—and in our opinion it has been met with just at the junction with the old lode in the 120, where it is worth 20 tons of copper ore per fathom, and like, as the agent states, a "quarry" of ore. Nearly 40 fms. further from this, in the 108, the new caunter is worth 70*l.* per fathom, and in the 48 a cross-cut is being put out to intersect it, and if found rich there then nothing ever found in East Caradon will equal Wheal Crebor, though the former rose to 55*l.* per share, or 350,000*l.* for the mine.

Sept. 13, 1879.—The reporter of the Scotch Mining Share Market gives the price of East Caradon at 10s. per share.

Sept. 13, 1879.—Alfred E. Cooke says a good demand has sprung up for East Caradon shares, and the price has risen from about 5s. to 30s., 35s.

Sept. 13, 1879.—In the Editorial remarks on the Mining Share Market I find the following:—East Caradon have been in request; they advanced from a nominal price on Thursday to 8s., then to 15s., and leave off 1 to 1¼. Marke Valley have also risen to ⅝, ¾.

From the Mining Monograph, November, 1879.—A "SELECTED" COPPER MINE—THE EAST CARADON COPPER MINE.—A highly promising undertaking, situated in the parish of St. Cleer, Cornwall. A very well managed example of the Cost-book System, divided into 6144 shares, upon which 3*l.* 4s 6d. has been called up. Shareholders' meetings are held at the purser's offices every three months. Present price, 2½ to 2¾. The mine adjoins the well-known South Caradon Mine, owned by a company working in 512 shares of 1*l.* 5s. each, and which has paid dividends of 744*l.* 10s. upon each share, and is still among the richest mines in the county. The shares now command a market value of 55*l.*, or 4300 per cent. premium. Some few years since, upon a very important discovery of copper, East Caradon Mine shares rose from 1s. 6d. each to 50*l.* per share, and for several years good dividends were paid, until the decline in the value of copper absorbed all the profits, and left the mine working at a loss. Copper is now rising in value, consequently this mine is again commanding attention, inasmuch as the present position of the workings corresponds in a remarkable manner with the existing condition of things prior to the great rise which is mentioned above. At the present moment the prospects of cutting one of the rich South Caradon lodes, and making an important discovery, are extremely favourable, and, if fully realised, the shares will have an enormous rise. We, therefore, very strongly advocate the purchase of a few shares to put by and hold for a few months.

From Money, Nov. 19, 1879.—THE MINING SHARE MARKET.—During the past fortnight a very large amount of business was done in the Mining Share Market. It was again generally remarked that at the last settling day the account was heavier than has been known for several years past. This is one of the numerous confirmations that go to strengthen the statement made by the Premier at the Guildhall banquet—"The present is not a mere spasmodic revival of trade, but a revival that has in it every element of permanency." Tin has fluctuated, and it has generally been felt that the shares are too high. Looked at as a whole they have dropped considerably from the highest point reached, though some have well maintained their position, despite the attention we called to the large debit balances which many of them will have to clear off ere they can pay dividends. Copper shares are in greater favour than they were a fortnight ago, and mines that have been working at a loss for years are now beginning to hold up their heads, and dream of dividends instead of calls. East Caradon, as a low-priced speculation, deserves more attention than it has received, and our readers would do well to give it a place in their thoughts, and that right early. These shares some years ago stood at 50*l.* each, and, as the old song says—"What has been may be again." Should the lode be cut as expected, then any man knowing the exigencies of the Cornish share market need not fear for his reputation if he predicts a rapid rise in East Caradon of from 15*l.* to 20*l.* a share.

From Money, Dec. 3, 1879.—East Caradon is in strong demand, and buyers are more eager to close with offers than sellers. The unanimous opinion of the entire market is that these shares are about to have a great rise. They were at one time over 50*l.* each, some years ago, and with the improved price of copper and a likelihood of new discoveries it is thought they may now have an important advance.

From William Watkins' Share List, Dec. 1, 1879.—In East Caradon the outlay of 3*l.* 4s. 6d. per share has returned 90,000*l.* profits.

Also from William Watkins, Dec. 3, 1879.—Since going to press East Caradon have risen to 3¼, and I consider they will go much higher, as also will Crebor, which are firm at 8, and South Wheal Crebor, which have risen from 25s. to 27s. 6d.

From Money, Dec. 17.—THE MINING SHARE MARKET.— . . . . Amongst other market gossip is the whisper that East Caradon are about to have a great rise.

To meet the wishes of some of our readers who have asked us to indicate a few mine shares for purchase, we annex the following list of some that we have every reason to believe will prove very satisfactory purchases, and yield large profits during the coming year:—Copper Mines, &c.: Panulcillo, East Caradon, Rio Tinto, Marke Valley, Cape, Wheal Crebor, also Prince of Wales, and Phœnix United.

In the price list attached East Caradon were quoted in October at 1, and on Dec. 16 3½, showing a rise of 2½ in about two months.

The foregoing was compiled by my late and much respected uncle (Mr. Joseph Hill) in the month of January last, and whose death occurred on Jan. 31; he was in his 84th year, and was well known as

one of the pioneers of his profession as a surveyor and valuer, but during the principal part of his life he evinced a warm interest in all matters appertaining to mining enterprise. I might add that as one of the executors to his will I sold in March last his East Caradon shares at 4*l.* 2s. 6d., and his Marke Valley shares at 2*l.*

Southampton, April 12. WILLIAM BURROUGH HILL,
Surveyor and Valuer.

[For remainder of Original Correspondence see this day's Journal.]

REPORT FROM CORNWALL.

April 15.—It is really hardly worth while to chronicle the vagaries of the smelters. Up on Monday, down on Saturday, some firms quoting above the official figures—there is really nothing locally worth troubling about, and we must look very much further afield if we would arrive at any reliable conclusions as to the future of the metal market. Under such circumstances as these it is almost idle to talk of the tin standards at all. The smelters appear to be living a merely dependent hand-to-mouth sort of life, and to be utterly destitute of that commercial courage which established the reputation of their predecessors. This sort of action may be safe, though that is not quite certain, but it is very objectionable to the producer. Our belief certainly is that the statistics point at no distant period to very much better prices than we have yet seen since the reaction.

Meanwhile West Basset as well as Dolcoath shows us what can be done even at present prices. A profit of over 5000*l.* in a quarter is a very substantial profit indeed, and we are quite inclined to agree with Mr. Daubuz that moderately high prices are better than very high. Indeed that is a point we have always contended for, though probably the range would be better fixed at about 55*l.* to 65*l.* a ton than the 50*l.* to 60*l.* mentioned at West Basset. It is really idle now to feel any doubts as to the future of our mining enterprise when individually and generally such magnificent proofs of its stability and enduring character are being continually afforded.

Before long we shall see what boring machinery will do for Cook's Kitchen and West Frances. In both mines the "bores" have been set to do work of great importance to the future welfare of the respective mines. After all, however, the progress of boring machinery in the county is far too slow. Some special interest attaches to the operations at the two mines named, from the fact that at West Frances the borer is worked from a bar whilst that at Cook's Kitchen is worked from a carriage. If the two systems can be fairly tested against each other it will be a great advantage in a practical point of view. Our own idea has always been based upon experience, not confined to the county, that both the bar and the carriage differ so much in adaptability that in different conditions the advantage may be with each in turn. However, this is a point by no means settled.

We do not regard the question of the sale of tin as materially helped to a solution by the recent discussion at Dolcoath. It was inevitable that, introduced as the subject then was, it should resolve itself for the nonce mainly into an issue of competition between two rival smelting firms. That, however, is just the lowest and poorest basis upon which it can be placed. The contention that Dolcoath, or any other mine, should buy in the cheapest and sell in the dearest market—which really requires no argument to enforce—has no necessary connection whatever with the merits or demerits of the present system of smelting brokerage. We want to see the whole question fairly and practically discussed devoid of all side issues. For just see where they lead. It is an admitted fact that the Messrs. Williams have practically a monopoly of the tin raised at Dolcoath, but how far does that knowledge advance us towards a solution of the problem whether, so far as that mine is concerned, this monopoly works well or ill? That is a disputed point on which issue is directly joined. The mine committee say that by this arrangement they are sure of an extra 1*l.* above the standards all the year round. Outside authorities on the contrary declare that the Dolcoath tin is really sold below market value. Now, of themselves all monopolies are suspicious, and we do not wonder that there are such feelings abroad; but we repeat the mere question whether the Dolcoath produce shall go into one hutch or another need not of itself involve anything in the way of a principle. Indeed, at the Dolcoath account, except for the allusion to selling tin by ticket, there was really no point involving a principle raised. Why does not the Mining Institute take this matter up, so that the whole subject in all its bearings shall be thoroughly and practically discussed?

To us we frankly confess that sale by ticket seems not the smallest improvement on the present mode. We are told that smelters are in a ring now; what would there be to prevent their being equally in a ring then? Besides, as things now are, and imperfect as the present system of sale undoubtedly is, it is open to a seller to reject a price offered if it seems to him unduly low. It would be idle to think of attempting to do any such thing if ticketing were the rule. Do our copper ticketings work so satisfactorily that there are many adventurers who would wish to extend their area?

Our belief continues to be now what it has been all along, and what it will continue to be unless more cogent arguments are advanced than any we have yet heard—that the real question to be settled is the condition in which the mines shall take their produce into the market—whether as black tin or white.

The reasons in favour of our larger mines at any rate smelting their own tin are threefold. In the first place there is clearly a profit to be got out of the process of smelting, and we can see no reason why the mines should not have it. The original fortune of the Rothschilds was built up by a concentration of all the profits which attached to the articles in which they dealt, however small such profits might individually be. Here at least is an excellent example. In the second place, it is certainly better to send your produce into the market in the most concentrated form. In the third place, if our mine managers are dealing with metal brokers instead of smelters they are dealing with a much larger constituency, one in which there is much less chance of combination, and from which they have a much better right to expect the results of competition. Besides, if it pays the smelters to sell to the brokers, surely with the exercise of ordinary business prudence it would pay the mines to deal with the same parties without the intervention of a middle man. We must remember that in these days of railways and telegraphs the London metal market is at everyone's door. We repeat, what we want to see and what Cornwall needs in this matter is the discussion full and free of first principles. We have not really been aided one whit towards a real settlement of the question by the conversation at Dolcoath.

As a rule a man of wealth has his fortune immensely exaggerated by common report. This, however, was certainly not the case with the late Mr. John M. Williams, for in addition to his immense landed property his personal estate alone was sworn under 1,600,000*l.* It is of interest to see how these large funds are distributed. Mr. Williams bequeaths to his wife 2000*l.* and 6000*l.* per annum during life or widowhood; he also leaves her for her personal use for the same period his residences, Carhayes Castle, Burncoose, and Pengreep, with the pictures, prints, plate, and books, but the furniture, household effects, horses and carriages he gives to her absolutely; on Mrs. Williams's death or second marriage such pictures, prints, plate, and books are to go to his second son, John Charles Williams, and he gives him as well all his minerals. To his eldest son, Michael Williams, he bequeaths 100,000*l.*, and he devises to his use for life the Gnaton Hall estate, Devon, and all his other estates in the same county, and all his estates in the town and parish of Calstock, Cornwall, and its vicinity, except any premises or lands used for his businesses, with remainder to his first and other sons successively, according to their respective seniorities in tail general; the remainder of his property in Cornwall or elsewhere, except any premises or lands used for his businesses, and subject to the rights of residence given to his wife, he settles to the use of his said son, John Charles Williams, for life, with remainder to his first and other sons successively, according to their respective seniorities in tail general. To each of his other sons (if any) he gives 100,000*l.*; to his daughter, Mrs. Elizabeth Bolitho, in addition to her settlement, 8000*l.*; to each of his other daughters, 25,000*l.*; to his executor, Mr. Cady, 500*l.*; and an annual sum is to be paid to his trustees during the continuance of the trusts; and there are some legacies to servants. A very singular fact is that while under the will Mr. Williams's smelting and other businesses were to be wound up, and the net proceeds of the same, with the residue of the personalty held in trust for his son John Charles Williams—this particular provision is not to be carried out. Shortly before his death it appears (though he had not time to embody the directions in a codicil) Mr. Williams gave verbal instructions that the businesses were still to be carried on; and we learn from Mr. H. S. Stokes, the solicitor to the executors, that "Steps are being taken to obtain the sanction of a Court of Equity to the immediate transfer of the copper business conducted by the testator in the names of Williams, Foster, and Co., to the testator's eldest son, Mr. Michael Williams, who had before his father's death been actively engaged in it; and, until such sanction is obtained, that extensive business will be conducted by the executrix, Mrs. Williams, and her co-executor Mr. John Cady, who has for many years been the manager of Mr. William's copper works at Swansea. This is unquestionably "very good hearing." It would have made a great gap in the metal trade if Williams, Foster, and Co., had dropped out. We believe young Mr. Williams is a thorough man of business.

There have been several mine accidents of late, and some that certainly seem to point very strongly in the direction of the need of exercising greater care. For example, a few days since a man named John Blamey was killed at West Basset Mine by a piece of timber—a casing plank—falling upon him. Had there been a penthouse his life would have been saved, but an old penthouse had actually been removed; and neither the captain nor the men appear to have thought it should be replaced. Probably the jury could hardly come to any other verdict than that of "Accidental death" under the peculiar circumstances; but Dr. Foster was clearly of opinion that the action of the captain was illegal. The men ought to have covered over the place without being told to do so by the captain; and the captain ought to have made the men to do so. The illegality appears, however, to have chiefly consisted in allowing men to travel in the shaft before the close casing was completed. Anyway, this is another illustration of the immense waste of human life just through mere "want of thought."

TRADE OF THE TYNE AND WEAR

April 14.—The shipments of coal are expected to be good this week. The Baltic and Eastern Europe are now fairly open, and as the season advances the demand for steam coal improves. Of course, there is much competition; but the Tyne and Wear are able to hold their own—that is clear from the amount of business lately done and expected to be done. The market is steady, and the demand for small coal is so good that, instead of being a drug, which it was so long, it is becoming a help. In Durham the gas coal collieries continue to be well employed, and also most of the other works. The house coal trade continues flat, and the coke which has been sold lately has been disposed of at a reduced price; in some cases 5s. per ton less has been accepted than the prices got two months ago. The advance which has been established in steam and other coal is moderate, but it is hoped that it will be sustained. There is a marked activity observed in most of the finished ironworks, and also at the steelworks. At Seaham Harbour there is a great improvement in the iron trade. The blast-furnaces are now in full operation, employing about 150 men. The chemical works of Messrs. Watson, Keply, and Co. are also fully employed. The bottle works of the late Alderman Candlish are fully employed. The ironworks of Messrs. Cockburn and Co. have booked large orders, and all the men have full employment. The reports from the various factories show that a very satisfactory amount of work is in hand. Most branches of the iron industry on the Wear are very well off for work. The marine engine-works are pretty well off for orders for engines and boilers, and on the Tyne the same remarks apply. At Jarrow and other places orders are on hand for some very large engines and marine boilers. The iron shipbuilding yards are also generally well supplied with orders. The chemical market is rather quiet, although there has been a little more disposition to buy. Bleaching powder has advanced about 5s. per ton during the past week, and other classes of chemicals are also a little dearer. At Liverpool there is increased enquiry for chemicals, and more business doing. There is a marked increase in the exports, both as regards quantity and value. The excitement caused by the elections being over, and the reduction in freights, are likely to contribute to an early revival in the demand both for home trade and export.

At the North of England Institute of Mining and Mechanical Engineers meeting, on Saturday, papers will be read "On the Strength of Wrought-iron in Compression," by Mr. Wigham Richardson; "On an Apparatus for Preventing Overwinding," by Mr. Charles Ianson, communicated by Prof. A. Friere Marreco, M.A. The following papers will be open for discussion:—"Description of an Instrument for ascertaining the Inclination from the Vertical of Boreholes, and the Direction of such Inclination," by Messrs. Charles Zuthen Bumy and J. Kenneth Guthrie; "On the Extraction of Oil and Ammoniacal Liquors in Coking Coal in Ovens," by Mr. Henry Aitkin.

The recent orders for iron and steel rails from the United States are beginning materially to increase. According so the official statistics for last month the quantity of iron rails exported was rather over 12,000 tons—an increase from 3000 tons in the corresponding month of last year—and of this quantity the shipments to the United States are fully five-sixths. The quantity of steel rails exported also increased, but not so largely, the total for the month rising to 26,000 tons, an increase of 3000 tons on the quantity for March in last year. Towards this increase the United States and British India were the chief contributors, Australia presenting decreased shipments.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

April 15.—The ironmasters did not either yesterday in Wolverhampton or to-day in Birmingham give a very bright report of the amount of new business which had resulted from the Quarterly Meetings. Pig-iron consumers find that their stocks are large enough for the present to satisfy their requirements; hence they do not care to enter the market with freedom. Manufactured ironmakers experience some difficulty in getting all the specifications which are needed to keep the works actively running. The best news is that the Americans are again buying with some spirit. One case is mentioned this week in which a Shropshire firm has received a *bona fide* enquiry for 3000 tons of miscellaneous descriptions. There is a lack of readiness to fall in with the prices which makers demand, but the probabilities are in favour of producers securing pretty much their own terms when negociations have been carried on a little further. Prices are unaltered upon the rates quoted a week ago. Furnace and forge coal is in good but not pressing demand, at prices based upon 10s. for Earl Dudley's furnace sorts. His lordship's best steam slack is selling at 5s. per ton, and second qualities at 4s. 6d. Satisfaction was general upon the iron exchanges this week at the announcement that the displays of finished iron made at the Sydney Exhibition by the Earl of Dudley and Messrs. William Barrows and Sons should have secured for each of these firms a gold medal award.

It became known on 'Change in Wolverhampton on Wednesday that the Hamstead sinkings have now reached a depth of 607 yards. The evidences that the thick coal is near at hand are almost irrefutable. If it should not have been passed through by the date of the annual meeting at the close of this month, the meeting will be adjourned for a few days, when the shareholders will have had an opportunity of inspecting the thick coal *in situ*.

A meeting of the Mill and Forge Wages Board will be held in Birmingham on Monday next to consider, before Mr. Joseph Chamberlain, M.P., the arbitrator, the sliding scale question for the regulation of ironworkers' wages. Mr. Chamberlain will fix the scale. What it will exactly be there is at present nothing definite to show.

A conference of miners was held at Tipton on Monday to consider the advisability of dispensing with the present wages sliding scale known as the Birmingham agreement. Most of the 37 delegates present were of opinion that a rise in wages of 3d. per day should be given without any advance in the price of coal being necessary, and then 4d. per day advance for every 1s. rise following in coal. After considerable debate, and by the casting vote of the Chairman, a motion to appeal to the masters for an improvement in the sliding scale, and failing this then to give notice not to be bound by it was carried against a motion in favour of at once terminating the agreement.

William Bickley, the owner of the Denby Hall Colliery, Dudley Port, was charged at Wolverhampton on Wednesday with a breach of the Mines Regulation Act. Defendant had neglected to carry air troughs into a new headway 8 ft. long, and on Dec. 27 last an explosion of gas occurred in it which resulted in the death of one of the workmen. It was shown that the certificated manager had not been in the pit for a week previous to the explosion. The case was not finished, and the further hearing was adjourned.

The South Staffordshire Mill and Forge Managers Association 14th annual report congratulates the members upon the returning activity in the iron trade. After an unusual period of the keenest depression and commercial distress, indications of a revival have now happily set in, which it is hoped may be of a permanent character, and bring enduring prosperity alike to employer and employed. During the year six papers have been read bearing upon the treatment and manufacture of iron. They were (1 and 2) "The use of salt iu the puddling-furnace," and (3) "Iron and steel manufacture embodied in a condensed form." In connection with this paper the writer claimed that it was in South Staffordshire that the Bessemer furnace was first worked. The other papers were—(4) "Suggested improvements in the construction of the puddling-furnace," (5) "What effect does water have upon iron in the puddling-furnace?" and (6) "The behaviour of sulphur in the manufacture of iron." Much practical information was obtained in all the papers, and each of them was heartily discussed. The Association is in a flourishing condition, and numbers 68 members, which is an increase of seven upon the year. At the annual meeting, at which the report was presented, held at Dudley. Mr. Edward Harris, of the Brettel Lane Ironworks, Stourbridge, was elected president for the ensuing year, and Mr. Joseph Morris, of Dudley, vice-president. Mr. Richard Edwards was reappointed honorary secretary, and Mr W. Barnett, treasurer.

The Commissioners of the Sydney Exhibition have awarded a gold medal to Lord Dudley for his splendid exhibit of iron, and a similar gold medal to Messrs. Parsons, of the Bloomfield and Factory Works, Tipton, for their case of finished iron. Messrs. C. Brandauer and Sons, steel pen manufacturers, of New John-Street West, Birmingham, have been awarded a gold medal at this Exhibition in respect of their pens. The Commissioners also awarded a gold medal to Messrs. N. Hingley and Sons, Netherton Ironworks, Dudley, for their case of finished iron.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

April 15.—The scheme for establishing an Institute of Mining Engineers for North Wales has been placed in abeyance during the excitement occasioned by the elections, but it is hoped it will not be allowed to die, although, as I understand, more names are required in order to float the society with prospects of success.

The first impression of the work on Metalliferous Minerals and Mining, by Mr. D. C. Davies, of Oswestry, being nearly sold off a new edition is in course of preparation. It is to be hoped that the author will embrace this opportunity to supply omissions, and to correct errors which in a book covering for the first time so wide a field was partly unavoidable. The author would, doubtless, be glad to receive suggestions from mining men.

The Coal Trade has fallen back to its old state of quietude. Possibly an increased demand for shipping purposes may now spring up, otherwise we can hardly expect any improvement until towards the close of summer. On the day following the date of my last report the port of Carnarvon presented a busy aspect; the loading of vessels with slates was going briskly forward, and the arrival and departure of vessels from the slate quay presented a very animated appearance. The slate trade, especially for average sizes and best quality, is recovering its normal condition. Advantage should be taken of this revival in the trade to bring in capital to such of the Carnarvonshire quarries as are lying partly idle from a want of means, which in its turn is in many cases the result of past mismanagement. There is a good field here for the employment of intelligent effort and moderate amount of capital. Some of the quarry owners are very cross concerning the result of the county election, and one well-known owner has threatened to closs his quarry for six months. People are found who do very foolish things, but it is not often that so suicidal a policy as this is carried into execution.

Copper mining is looking up in the Principality, and it is hoped that good times are in store for the Anglesey mines. With better prices, and now that railways are constructed through the country, the copper mines around Snowdon, near Llanberis and Beddgelert, may be resussitated. Lead mining is going on quietly throughout this district, and I think that, on the whole, it is in a healthier state than formerly. There are, however, a number of mines from which great things were promised, from which it is getting time that we should hear more satisfactory results. The limestone quarries are busier than they were, and the fire-clay works and the principal paying sett quarries are in good work.

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

April 15.—Allusion has already been made in these columns to the frequently over-crowded state of the Alexandra Dock at Newport, and the complaints of shippers as to the amount of business which they lost in consequence of a lack of adequate dock accommodation. Now, it is satisfactory to be able to state that Mr. Abernethy, the consulting engineer of the dock, has had instructions to make a preparatory survey of the dock with a view of increasing its facilities. The Midland Railway Company are taking strenuous steps to oppose the proposed absolute purchase of the Monmouthshire Railway by the Great Western Company. Should it be decided that the Midland have a *locus standi* against the Bill they will probably stoutly oppose it unless running powers over the Monmouthshire are acceded to them. In common with other works in the district, the Rhymney Ironworks are being extended. The new rail engines were started on Monday in the presence of a large assembly. The engines will roll rails of one, two, or three lengths of 30 ft. each. The first steam was put on by Master E. Evans, son of the manager. Mr. Hilton, C.E., chief engineer to the company, has supervised the construction of the engines. Mr. Hilton intends, to the great regret of many, leaving shortly for another appointment in the North of England. Seven men have been injured by an accident which has happened at the Dowlais Works. It appears that while a heavy iron girder 100 feet long, which was to be used in forming the roof of a new mill at the Bessemer Works was being hoisted the chain broke, and several persons beneath were injured, three of them severely.

The house coal men have put their alleged grievances against the sliding scale into form, and have published a manifesto, which they have sent to the associated masters. The men denounce the present terms as unfair in the extreme; and, therefore, ask the association to rescind a resolution passed by the sliding scale committee on March 6, and to grant them the privilege of bringing forward their grievances, and vindicating their rights before an impartial tribunal; otherwise they decline to acknowledge themselves as being governed by conciliatory measures. One "grievance" is that there is no minimum rate of wages fixed. The manifesto is signed on behalf of a meeting of 5000 men recently held.

The iron and steel trades have been tolerably brisk, and clearances have been large. These have mainly been to the United States, Brazil, India, and Australia. The fact cannot, however, be ignored that of late the American demand has not been quite so good, and less enquiries are coming from that quarter. Still the works—as, for instance, at Blaenavon—are preparing to increase the facilities for enhanced production. The colonial demand appears to have looked up a little, and prices quoted at the works for finished iron, such as rails and bars, have not materially changed. There is no mistaking the fact, however, that quotations for pig-iron have receded to some extent. Old rails, &c., seem to find a pretty ready sale at recent rates. The Stuart Works, Hirwain, were expected to start shortly, and the blast was to be put on this week.

It is useless trying to conceal the fact that there is a serious adverse reaction in the tin-plate trade. There is quite a lull as to enquiries. Sales and prices are receding fast, and common cokes are fully 7s. 6d. per box lower than in January last. Even at this figure there were scarcely any orders booked at the quarterly meeting in Birmingham last week. The meeting at Birmingham was largely attended by manufacturers and tin-plates merchants, but how strikingly different was the demeanour of the makers as compared to the January meeting. Then all were jubilant and jolly, and seeking extravagant advances on the then price of tin-plates, which positively frightened the Liverpool and London merchants into a state of melancholy stupor. But last week the tables were turned quite upside down, as the merchants were keenly sought after, and imploringly pressed to dole out a few orders. The majority, however, had to go home to their respective works, to prepare room to stock their unsold ware. The late rise in the price of tin-plates was too rapid to be lasting, and the recoil is only the natural result. The reaction had set in some weeks before the announcement of a dissolution of Parliament was made, but possibly the excitement attending upon a general election did not tend to improve matter. The prices of tin-plates, pig-iron, Cleveland bars, and steel bars are fluctuating.

Briskness has characterised the coal trade during the past few days. Shipments have increased, particularly over sea, and the demand has been well kept up. Some good orders have been received, and some colliery proprietors' books are pretty full up. Buyers, however, have been operating at low figures, and there seems to be no present prospect at least of an increase in quotations taking place. The house coal department has been moderately brisk, but not quite so active as of late. The action taken by the men, and above alluded to, has caused some discussion among employers generally. At the Ystrad Rhondda collieries work has been going on regularly for some time past, and this has been the case at other pits in the locality. In the Rhymney Valley business is also fairly good. There is a rather better demand for anthracite qualities. Patent fuel is somewhat dull, but fresh orders are expected shortly. The coke department has been about as active as usual. Coke ovens are in course of erection at Ynsfach, Cyfartha, and the number is to be extended to 70.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

April 15.—The excitement consequent on the elections having subsided business has again got into something like its ordinary groove, and the men are now working as usual. The lead miners have been amongst the quietest partisans, although at one time it was expected that Mr. Wass, who is by far the largest producer of lead ore in the county, would have been one of the candidates for parliamentary honours for that division of Derbyshire in which the mines he is connected with are situate. Trade, it may be said, has undergone but little change of late, so that there has been an average production of pig, the sales of which have become steadier than they were, there being nothing now in the shape of speculation on the part of purchasers. In manufactured iron there has been a fair output, the mills and foundries being fairly employed. At the steelworks, also, business continues good, and the production has been well kept up, and is likely to be for some time to come, as good orders are in hand, and no doubt when completed they will be replaced by others. There has been a decided decline in the trade doing in house coal, so that several collieries have been working less time, and a still further reduction in the working hours is likely to take place. This will be evident when it is considered that the consumption of house coal during the summer months will be considerably less than it is now, The demand for London from several collieries has fallen off in a marked manner, and it appears that Clay Cross alone in March sent something like 6000 tons less than in February, while some thousands of tons less were also debited to Eckington and several other of the largest collieries in Derbyshire. The business doing in steam coal has improved, and is likely to continue to do so. Still prices are very low for coal of every description, so that mining in many instances is attended with a positive loss, and where profits are made they must be very small indeed. Coke-making appears to be about the most profitable branch there is in connection with the raising of coal, and a good deal is being sent into Sheffield and the neighbourhood for smelting purposes.

Trade in Sheffield continues in a healthy state, and some of the mills are running night and day, so great is the demand just now for some descriptions of rolled iron. The Admiralty, as was expected, has considered the very important question as to the best description of armour-plates for our vessels of war, and, as I anticipated would be the case, have evidently decided in favour of those having a facing of steel with a backing of iron, and with these it is intended to sheathe the Ajax, and a few days ago a 16-in. plate was sent away to be tested at Shoeburyness. That it will stand the necessary test admits of no doubt, so that there is likely to be some heavy orders put in hand for these plates by our own Government. Other Governments will follow in the wake of England as regards plates of iron and steel, and as Sheffield makers are able to hold their own against all others, what may be termed a new and important branch of trade will be struck out for the town that will keep the mills busy. Composite plates it may be said are now being made for some war vessels now being built in this country for the Argentine Government, and quite recently there was sent to France from the Cyclops Works a plate to compete with some produced by French manufacturers. The Bessemer mills have been turning out large quantities of rails, and orders continue to come to hand, so that there is every promise of a long season of activity. Ordinary plates, sheets, and bars are in fair request, whilst a steady business continues to be done in telegraphic and other wire. In general railway material there has been a good demand, America being still about the best customer we have, the next being British India. Cutlery manufacturers have been doing a steady business in both table and pocket knives, whilst file and saw makers have been much better employed than for some time past.

There is a larger consumption of crucible steel than usual, a good deal being used for structural purposes instead of iron. A little more activity, however, is discernible at some of the foundries, especially in the shape of palisadings, stoves, grates, and builders' castings generally, whilst gas and water pipes are also now in tolerably fair request. Engineers and machinists continue to be fairly employed, and their position contrasts most favourably with the corresponding period of last year. In South Yorkshire the coal trade is in anything but a healthy state, especially as regards household qualities, the business in which has declined considerably, so that some of the pits are not working more than three or four days a week. Steam coal has improved in demand, but as it has to be got along with the household colliery owners do not care to stack the latter, so that the production of the former is limited, seeing that to teem the soft coal on to the pit bank greatly deteriorates it, incurring a serious loss in value. A steady business is being done in coke for smelting, a considerable tonnage going into Sheffield and the district, as well as to the furnaces in Lincolnshire. The dispute continues at the Monk Bretton Colliery, and there are no signs of its terminating.

On Wednesday evening the members of the Mining Institute of Engineers and several friends of the Midland Institute of Mining, Civil, and Mechanical Engineers, sat down to dinner at the King's Head Hotel, Barnsley. Amongst those present were:—Mr. W. Smith, Mr. T. W. Embleton, M. E. Methley, near Leeds; Prof. Grey, Yorkshire College, Leeds; Mr. Ald. Carter, C.E., F.G.S., Barnsley (president); Mr. Ald. Marshall, Mayor of Barnsley; the Rev. W. W. Kirby, Rector of St. Mary's Church, Barnsley; Mr. G. Sidebottom, East Gawber Colliery, Barnsley; Mr. J. Beaumont, Oughtybridge, Sheffield; Mr. J. Overend, Mitchell's Main Colliery; Mr. A. B. Southall, Monckton Main Colliery; Mr. R. Miller, Strafford Colliery; Mr. F. H. Pearce, Bowling Ironworks; Mr. W. Brearton, Whitwood Colliery; Mr. G. J. Kell, M.E., Barnsley; Mr. W. L. Liversedge, West Melton Colliery; Mr. J. Nerven, Mirfield Coal Company; Mr. R. Wilden, Rockley Colliery; Mr. W. Keethley, Robin Hood Colliery, Wakefield; Mr. C Hodgson, Chapeltown, near Sheffield; Mr. Joseph Mitchell, Mitchell Main Colliery; Mr. G. Hutchinson, manager Barnsley Gasworks; Mr. C. H. Hutchinson, Mr. W. H. Chambers, Barnsley; Mr. J. Wilson, the Oaks Collieries; Mr. T. R. Maddison, Thornhill Colliery, Dewsbury; Mr. C. Rhodes, Carr House Colliery; Mr. W. Ward, Churwell Colliery, Leeds; Mr. J. Ryder, Leeds; Mr. J. Tyas, Edmunds and Swaithe and Main Collieries; Mr. John Tyas; Mr. J. Hinchliffe, Bullhouse Colliery; Mr. W. Ward, Manner's Main, Wath; Mr. G. Lane Pitt; Mr. V. Smith, Strafford Colliery; Mr. Robinson, Mr. C. F. Seward, Strafford Colliery; Mr. R. R. Maddison, Barnsley; Mr. W. Lister, Monk Bretton Colliery; Mr. W. E. Garforth, West Riding Collieries, near Leeds; Mr. W. B. Hodgson, Chapeltoun, near Sheffield. Letters of apology were received from the following gentlemen:—Earl Fitzwilliam; Lord Ripon; Lord Frederick Cavendish; Lord Edward Cavendish; Mr. W. S. Stanhope; Mr. L. R. Starkey; Prof. Miall, Yorkshire College; Mr. F. N. Wardell, Inspector of Mines for Yorkshire; Mr. Thos. Cooper; Mr. Thos. Knowles; Prof. G. F. Armstrong, Yorkshire College, Leeds; Mr. Robert Baxter, Chairman of the Steam Coal Owners' Association; Mr. Thos. Cadman, Inspector of Mines, Newport; Mr. Stewart, Wakefield; Prof. Thorpe, Yorkshire College; Mr. Thos. Bell, Inspector of Mines for Durham; Mr. T. E. Wales, North Wales; and Mr. R. Russell, St. Beas, Cumberland. After dinner the chair was taken by the President (Mr. R Carter), when the usual toast-list was gone through. Prof. Green proposed "The mining interests of the country, and the coal trade generally," which was responded to by Mr. Embleton. "The learned and scientific societies of this and other countries," "The Mayor and Corporation of Barnsley," "The vice-presidents and officers of the Institute," and other toasts were drunk, and altogether a very enjoyable evening was spent.

REPORT FROM FOREST OF DEAN.

April 15.—The stoppage of the New Fancy Colliery, which we noticed in a recent report, has occasioned a painful increase of poverty and distress in West Dean. That township has been specially unfortunate of late years. There was the stoppage of the steelworks, followed afterwards by the closing of Parkend Works, as well as several mine works and some collieries, and recently the stoppage of the Fancy Colliery. The tin-plate works have been re-started under new proprietorship, and the furnaces have also changed hands, but there is lamentable delay in re-starting active operations with a proper complement of workmen, and hope deferred, the proverb saith, maketh the heart sick. The people of West Dean have had great trials for their patience and endurance, and unless luck comes to them in a revival of industries in the township their case will be extremely difficult of remedying. It seems almost unique, for unlike many poor men, workmen in general, numbers of them nominally own the cottages they live in, which disqualifies them from coming on the rates for relief. We say nominally own their cottages, for it is understood that most, if not all, of them are deeply mortgaged; and, money being extremely scarce, they can neither sell them nor get further advances. Some philanthropic persons are again attempting to revive relief works in their favour, but the attempt is only at present in its incipient stage. East Dean has been in the habit for many years of affording assistance to the sister township hy its collieries, giving employment to many workmen resident in West Dean, even whilst colliers of East Dean have been far from fully employed. Some of the collieries being situate nearly in the centre of the basin, numbers of colliers resident in West Dean walk to and from them to prosecute their work to gain a livelihood; so that East Dean bears part of the burden of both townships—or rather bears all her own and part of the burdens of West Dean and other near parishes. The hardware industries are scarcely so well placed just now, and there is a degree of slackness come on in the export (to use a nautical phrase for land transit) of ore just at present. Another matter invites remark, but post-time is too near to admit of doing so at present. We may add, however, that the stoppage of the Fancy pit has had the effect of slightly improving the coal trade at some of the pits in East Dean.

Meetings of Public Companies.

ECONOMIC LIFE ASSURANCE SOCIETY.

The annual general meeting of members was held at the offices' Bridge-street, Blackfriars, on Saturday,

Mr. HENRY BARNETT in the chair.

Mr. GRIMES (the secretary) read the notice calling the meeting.

The General and Assurance fund accounts were also read.

The CHAIRMAN, in moving the adoption of the report and accounts, said it would not be necessary to detain the meeting with any lengthened comments. The members would remember that last year a very full exposition was given of the affairs of the company, and they would also remember the very satisfactory results which were then brought out. The attendance then was naturally larger than on the present occasion; but he hoped those gentlemen who were now present took sufficient interest in the matter to allow him to make some few comparisons between the figures of the past and the preceding year, as had been his custom. In doing so he would first draw their attention to what might strike them, without observation, as a little puzzling, and that was that some of the figures which he might quote might not exactly tally with the figures in the accounts now presented. The printed accounts represented the state of the transactions as they passed through the books, and were completed. The figures to which he would allude would in some cases be found to be different, because they represented the business which had gone through the office, and which had not been completed either on one side or the other on the day to which the accounts were made up, but which formed part of the business belonging to the year. There had been nothing very remarkable in the figures. As they were all probably aware, the year had again been one of commercial depression till within the last two months; and the directors had, unfortunately, been obliged to come to the conclusion during the past two or three years that the general state, he would not say of impoverishment, but at any rate want of profit in trade, had led to what they heard and saw on all sides—reduced expenditure and economy introduced into the establishments, and the mode of living for a great number of people for the necessities of the times, which would naturally lead one to suppose that life assurance would suffer in common with many other modes of putting by money as an investment. At the same time he thought the members would see that, on the whole, the Economic had held its own, and that the statement was altogether satisfactory. The proposals received in 1879 were 443, against 398 in 1878, showing an increase of 47. The policies issued were 353 against 319, showing an increase of 34. The sums assured had been rather less—273,336*l.* in 1879, against 275,280*l.* in 1878, showing a diminution of 1944*l.*; proving, therefore, that although there had been a large number of policies, people could not afford to make them for so large an amount on the average. The total average of the amount issued was 775*l.*, against 863*l.* in the previous year. There were fewer policies issued for very large amounts such as 5000*l.* and upwards, but below that sum there were a good many more issued to make up the amount he had mentioned. With respect to the new premiums, they amounted to 11,215*l.* in 1879, against 9975*l.* in 1878, which was an accession of 1240*l.*, but that included single premiums and extra risks, which were beyond the ordinary premiums payable upon policies from year to year. The present total amount of premiums was 227,490*l.* against 228,223*l.*, showing a small diminution of 732*l.*, but, of course, that was liable to fluctuation as the policies fell due, and the office had to pay the claims. The total income for premiums and investments had increased by 1408*l.*, and amounted in 1879 to 372,365*l.*, against 370,957*l.* in 1868. The total assurance fund amounted to 3,379,702*l.*, against 3,375,359*l.*, which was an increase of 4343*l.* That might strike some members as being a smaller sum than they were in the habit of adding to the assurance fund, but when they saw what had been paid they would think they had done well to increase the assurance fund by that amount. They had also been fortunate with the investments, the average rate of interest received thereon having been 4*l.* 8s. 2d. per cent., against 4*l.* 7s. 3d., which had been obtained without sacrificing the safe character of the investments, which had always been maintained. The policies in force in 1879 numbered 10,096, against 10,072, and the sums assured were 8,281,085*l.*, against 8,306,000*l.* in 1878. The annual premiums payable upon those policies was 221,401*l.*, against 221,849*l.*, showing a slight decrease. The assurance claims paid during 1879 amounted to 333,332*l.*, according to the printed accounts, but that was a much larger sum than had accrued during the year—in fact, the claims against the office in 1879 amounted to 260,609*l.* on 234 policies, as against 254,000*l.* in 1878, but the amount accrued was less than the anticipation by 15,074*l.* During the past year they had paid the largest rateable bonus which had ever been paid by this office to the representatives of a deceased life. The person assumed was assured at the age of 52 for 2000*l.*; he lived to the age of 92, and the office on his death paid to his representatives the sum of 5620*l.*, which was a very large sum to receive. There was every reason to believe, from the communications sent to the office, that the bonus declared last year was very gratifying to the policy holders in general. There was a very large amount of ready money taken in payment of that bonus. They had paid out 78,000*l.* They had also made reductions in premiums on account of bonus to the amount of 5817*l.* The amount paid for surrender was 10,237*l.*, which was an unusually large amount, and showed that many people could not keep up their policies. The total amount paid last year was 381,540*l.*, and the total receipts 385,382*l.*, the difference between the two, after providing the expenses of the year, being 3842*l.* The decision which was come to at the time of the bonus decision to reduce the date of the payment of claims from six months to three months had told very heavily against the funds during the past year, as in consequence of that decision they had paid some 60,000*l.* earlier than they would otherwise have had to pay, but, of course, that would not occur again. They had cancelled by the payment of claims and other causes 289,000*l.* of reversionary liability on sums assured, and 247,000*l.* bonuses, so they had altogether reduced the reversionary liability by 536,000*l.*, which had been done out of the receipts. He thought that, on the whole, might be considered a satisfactory state of the accounts. The directors had not adopted any sensational mode of endeavouring to increase the business. The result in those cases in which it had been tried must be very uncertain for several years; but this office had gone on in the usual quiet way, and he thought everything had been as satisfactory as they could expect considering the times they had passed through. (Hear, hear.) He thought he might safely say that the ball went on rolling. During the past five years it had rolled up an amount which had enabled the directors to make up a very large division—in fact, an amount which gave them 500,000*l.* to the good. (Cheers.) The ball was still rolling, and if they lived to see another five years out they might, he hoped, see as satisfactory results as they had seen before. (Hear, hear.) He might state one fact which should be more known than it was, and that was that the Economic had made a considerable reduction in extra premiums charged for foreign risks. (Hear, hear.) The matter had been under the consideration of all the large offices, and the directors of this office had from time to time taken it into consideration, but they had often felt that offices which in a usual way were charging higher premiums than the Economic could afford not to charge so large extra premium for foreign risks. However, the directors had felt that it was necessary to make some alteration, and without unduly making the diminution they had in many cases reduced the extra premiums on foreign risks, or abolished it altogether; and although they had not yet fairly worked the thing out, they had come to some more complete conclusion on the subject than they had hitherto arrived at; and, on the whole, they had come to what they intended to be a liberal arrangement, and he hoped it would be satisfactory to those who had to pay the premiums. (Hear.) This office had had in its experience one remarkable case where a person assured for 5000*l.*, and was lost at sea in the first year of his assurance, and the small premiums received in that case went a very small way indeed towards making up the loss which accrued there. But now matters at sea were better managed, and he thought the losses were less than formerly. On the whole, he hoped that what the directors had done would be for the advantage of the office and for the assured in general. (Cheers.) In conclusion, the Chairman moved the adoption of the report and accounts.

Mr. RICKARDS seconded the resolution, which was put and carried.

Mr. ALBERT TURNER, who said he had been assured in the office since 1847, expressed his great satisfaction with the report, and after similar expressions from two or three other gentlemen the resolution for the adoption of the report and accounts was put and carried.

A resolution was then passed awarding the sum of 160*l.* to the auditors for their services during the year.

The next business was to elect two auditors in the room of Messrs. Howell and Stilwell, resigned. It was stated that the former had been connected with the office 25 years, and the latter 40 years.

On the motion of the CHAIRMAN, seconded by Mr. RICKARDS, Mr. O. E. Grant was elected an auditor in the place of Mr. Howell.

On the motion of the CHAIRMAN, seconded by Mr. REPINGTON, Col. Daniel was elected an auditor in the place of Mr. Stilwell.

On the motion of Sir MORDAUNT WELLS, seconded by Mr. TURNER, a cordial vote of thanks was then passed to the Chairman and directors, and the CHAIRMAN having acknowledged the compliment, the meeting broke up.

CANADIAN COPPER AND SULPHUR COMPANY.

An extraordinary meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Wednesday,

Mr. J. W. MACLURE in the chair.

Mr. W. G. WILLIAMS (the assistant secretary) read the notice convening the meeting.

The CHAIRMAN said in the very few remarks which he wished to make it would be necessary for him to be, perhaps, a little tedious in referring to the connection which the present directors had with this company, and he did so because it was their intention to send out a report to the shareholders spread all over the country who might not be present at this meeting. As they were aware, the directors had only held office for a very short time, and he might say that they had been strengthened, with the consent of the shareholders at the last meeting, by the addition as a director of his friend Mr. Adam Murray, of Manchester, who in his individual capacity, and as a trustee, was the largest shareholder in the company, and he (the Chairman) believed that in every step the board had taken they had Mr. Murray's entire approval. With regard to calling of the meeting, he might tell them that under the Articles of Association it was not at all necessary that it should have been called, as the whole of the powers which they intended to ask for were given by the Articles of Association themselves, but having taken the serious responsibility which they had of preventing the liquidation of the company, they felt that the shareholders—many of whom must be new to the company (judging from the number of transfers passed during the last 12 months)—should know every step that the board took. In the first place he might say that as soon as they took office they granted a lease of Hartford and Capel Mines and the Capelton Works to the Orford Nickel and Copper Company, and he believed the results of the labours of that company had been eminently satisfactory—at least, if they were to believe the announcements of American papers—and before the 12 months expired the board received several other offers from people in England and in America to lease the same works, and other portions of their property; and, therefore, in consultation with their advisers, Messrs. John Taylor and Sons, they had been taking active measures to develope and form an opinion of the value of their own property. They had determined—he might say at once—not to renew the lease to the Orford Nickel and Copper Company, which would expire in the course of about a fortnight or three weeks, and for the present at least they thought they would work the property for their own benefit. (Hear, hear.) There was not the least doubt that during the last 18 months—not by any new process nor by any very great secret that anybody possessed, but by the development and improvement of an old process—a process had been perfected by which the low quality copper ores could be worked most beneficially to the possessors of those ores, and they intended to work their low grade ores themselves. The Articles of Association gave them a fabulous amount of power, and according to their solicitor, Mr. Holmes, than whom no solicitor in the City of London occupied a higher position—(hear, hear)—they had the power to raise 300,000*l.* without the sanction of the shareholders at all; but as honourable men and as men of business they proposed to borrow 15,000*l.*, and they thought the proper persons to lend the money, if they chose to do so, would be the shareholders themselves, and to them the debentures would be offered in the first instance, and he intended to apply for his portion, with the option of changing them into ordinary shares of the company. It might be asked—How could they make such an exchange? They would find in the last balance-sheet a certain number of shares in the hands of the company which they were advised could not be legally issued unless it was at par, and, therefore, at any time that any shareholder wanted to exchange his debentures into ordinary shares of the company he could do so. He was sanguine enough to believe that most of the debentureholders would wish to make this exchange. Mining was a most speculative thing one could possibly invest in—one day they might have a golconda, and another day a blank; and, therefore, the directors declined in any way to prophesy as to the result, except to take the shareholders into their confidence, and tell them everything they knew themselves. The next point was as regards the leasing of the property. The directors had so many offers in their possession at the present moment that they thought it only right to take powers to lease a portion of the property. They did not want to burden the company with debentures, but they wanted to develope and work certain portions of the property, and as their mines were very extensive—he could not really say how many square miles they covered—it might be desirable to lease a portion of the property, and although the board had the power to do this they wished to have a formal resolution from the shareholders. Until he became a director he had never seen the Articles of Association, and probably very few of the shareholders had seen them. It was, therefore, very desirable that they should know the particulars with regard to this leasing. At the present moment he might say they had no intention of leasing any portion of the property. With regard to the mines, besides the Acton and Capel Mines, which they had heard of, he might state that they had received most satisfactory accounts of explorations in other properties, and only that morning they had received a telegram from Capt. Bennetts, their manager, from the Acton Mine. It would be remembered that in the circular sent out on Feb. 23 a telegram from the Acton Mine was inserted, stating that the mine had "much improved—report follows." Since that time the Canadian winter had broken up, and operations at the Acton Mine had for a certain time been stopped owing to the water which got into the mine, as it did into all other mines at the close of the winter. The telegram just received stated that the 30 was looking promising, and that the manager was having a sampling of ore dressed to send home, as he was instructed to do on March 27. The telegram also stated—"Capelton Mine good." With that telegram in their hands he thought the directors were perfectly right in terminating the lease to the Orford Nickel and Copper Company. The meeting was really called by the directors to take their co-partners into their confidence and to let them know as much as they knew themselves. If at any time they received any important information, satisfactory or otherwise, it would be at once communicated to the shareholders, their only endeavour being to bring about satisfactory results and to earn the further thanks of the shareholders. In conclusion, the Chairman moved—"That this meeting approves of the directors doing all things necessary to work and develope such part of the company's property for the benefit of the shareholders as they may deem expedient, and also of the proposed issue of debentures to the extent of 15,000*l.*, bearing 8 per cent. interest, in the terms of the assistant secretary's letter of the 9th inst., to provide funds for that purpose, and strongly recommends each shareholder to subscribe for his proportion of the same."

Mr. LAMBERT had much pleasure in seconding the motion, and added that when the directors got this 15,000*l.* they had no intention of throwing it away in following experiments which could not be considered satisfactory to the company. They intended beginning with the Capelton Works in a very moderate way—not to sink much money in machinery, but simply to make experiments which the present lessees had been carrying out so satisfactorily. (Hear, hear.) When they proved to their own satisfaction that the low grade ores—of which they possessed a large quantity—could be treated profitably then probably they would come to the shareholders, and ask them to sanction an extension of the works for smelting the ores; but, in the meantime, the directors would spend the money in the most economical way possible, so that the results might be better than they expected perhaps. (Hear, hear.) They had received about 4000*l.*, of which they still had about 3000*l.*; but, besides this, they had the satisfaction of knowing two important things in the meantime—one that the low grade ores could be treated profitably, and the other a discovery in the Acton Mine, which could not fail to be satisfactory. Some portion of the 15,000*l.* would be spent on the Acton Mine, and on the St. Frances and Capelton Mines and any other that might offer fair encouragement of success.

A SHAREHOLDER asked whether it was intended to have a further issue of debentures at a future period?—Mr. LAMBERT replied that they did not, unless the money so raised could be profitably employed.

The CHAIRMAN added that it was believed the 15,000*l.* would be sufficient; at the same time, if they found that it would be for the benefit of the company, after exchanging the shares, to have new works or to develope other properties, they would recommend a further issue of debentures; but they would not incur any further outlay without clearly laying their views before the shareholders. At the present time they had no idea of spending the 15,000*l.*

Mr. WM. ABBOTT thought the views of the Chairman with respect to the policy of raising this money rather than leasing the property to those who had had it before would be universally endorsed by the proprietors. Taking a great interest as he did in the Grand Trunk Railway of Canada, information reached him from Canada that a very valuable copper property was about to be developed on that line of railway; and after making enquiries in Canada and here, outside the board of the company, he took an interest in the company. The property of the company was situated between Montreal and Richmond Junction, and was especially favourably placed for the carriage of ores and copper to England at a very low cost. He understood that the directors had received some very extravagant offers to grant leases; but though lessees were very useful and very respectable

people, he thought that with the ability they now had at the board they could manage their business quite as well for themselves as any lessees could do for them. (Hear, hear.) If only one-half of what reached him should be realised, the results would far exceed anything they at present anticipated. However, before the circular reached him he was quite prepared to make the directors a sporting bid for the whole of 15,000*l.*, with the option of exchanging the debentures into shares at par. The directors had, perhaps, wisely and profitably decided to offer them to the proprietors, and he had not the slightest objection to that course. He was a holder of about 1500 shares, and he was quite prepared to take his proportion, and to pay bank notes for those debentures which the other shareholders might not take up. (Hear, hear.)

The motion was carried unanimously.

The CHAIRMAN then moved "That this meeting approves of the directors granting a lease or leases of the Capelton Works and the Hartford Mines, or of the whole or any portion of the company's property upon such terms as they may deem expedient." Of course no steps would be taken by the directors without first consulting the shareholders, and stating the whole of the terms which might have been proposed.——Mr. ADAM MURRAY seconded the motion, which was also carried unanimously.

On the motion of Mr. ABBOTT a cordial vote of thanks was passed to the Chairman and directors.

The CHAIRMAN, in acknowledging the compliment, said he little thought when his friend Mr. Mackintosh (the only member of the board who had not spoken at the meeting) asked him to go to Glasgow that the result of that visit would have been so satisfactory to the shareholders.

The meeting then closed.

CHONTALES CONSOLIDATED MINING COMPANY

An extraordinary general meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Wednesday,

The Right Hon. Earl NELSON in the chair.

Mr. J. JAMESON TRURAN (the secretary) read the notice convening the meeting, which stated that it was called for the purpose of winding up the company with a view to the formation of a new one

The CHAIRMAN having read the resolutions, which were subsequently submitted to the meeting, said that if the resolutions for the winding up of the company and the formation of a new one were carried by three-fourths of the shareholders present at the meeting either in person or by proxy it would be necessary to submit them for confirmation at a meeting to be convened for that purpose within a month and over 14 days of the present meeting. During the interval the directors would, for the purpose of saving time, consider the Articles of Association of the new company, so as to be able to submit them to the shareholders as early as possible. In case any shareholders were present at the meeting who were not aware of the action of the board on the former occasion he would like shortly to state that the first thing they did when they found their reduction officer had failed them, and that he had come back to this country owing to ill health without being able to do anything, and when as a necessary consequence there was very little chance of going on without a further attempt to send a reduction officer out to improve the yield of the mines, was to call the shareholders together. This was done by a general letter, and some of the shareholders (not many of them) very kindly met the directors in answer to that appeal, and they suggested that the board should summon a committee of shareholders, leaving the selection of the most influential shareholders in the hands of the directors. They picked out a committee of 24 shareholders, and of those chosen most of them wrote, and a great number attended, and gave advice on this weighty matter. The directors were obliged to tell them that for the purpose of keeping the company alive before any plan of re-construction could be thoroughly carried out it would be necessary to raise another 1000*l.* of debentures. He was happy to say—as showing the opinion of many of the old shareholders in the vitality of the company—that 420*l.* was raised in the room, and that the whole 1000*l.* had since been subscribed. This amount would, he had no doubt, enable them to pay any demands upon them for bills falling due until the resuscitation of the company could be effected. The meeting unanimously agreed to the proposal to voluntarily wind.up the company, and also to the scheme which had been foreshadowed in the circular sent to the shareholders. The scheme had been put before the solicitor, who had put it into a proper business-like form. He was happy to be able to inform the shareholders that a letter had just been received from the mines by way of America stating that they had fallen into a little better stratum of ore in the Estrella Mine near the end of the month, and the manager, being thoroughly aware of the situation of the company, had succeeded in somewhat reducing the cost, so that the balance was in favour of the company, although he had not worked very much. The cost for February was 430*l.*, and the value of the gold returned 500*l.* The yield in Estrella Mine had improved, and in the month amounted to 6 dwts. to the ton, which showed that the least jump up in the yield put a fresh face upon the company. The great reason the directors had in recommending the shareholders to re-form the company was that they might start afresh, free of debenture-holders, with money to work the properties sufficiently, and to send out a person to report upon them on the spot, and to improve the reduction works. There was every reason to believe that the reduction works could be very much amended, and if by altering them they could only just turn the balance a very little would make them a paying company. In answer to this appeal the directors had received some very favourable letters from some of the shareholders, and also one or two communications from dissentient shareholders. Proxies representing 13,000 shares had been sent to the directors.

A SHAREHOLDER asked how many shares there were in the company?——The CHAIRMAN said there were 62,000 shares. He was particularly anxious that the whole of the shareholders should assent to the winding-up of the old company and the formation of the new one as suggested. He would be very happy to listen to any suggestions or remarks which might be made, and, reserving the right to reply to any observations, he moved the first resolution—"That the company be wound-up voluntarily."

Mr. STIEBEL asked if the cost of the liquidation had been ascertained?——Mr. BISCHOFF (the solicitor) said if there were no serious opposition the legal costs would be very small. The stamp for the registration of the new company would be 30*l.*, and then there would be the cost of printing.

The Rev. Mr. COOPER seconded the resolution, and expressed a hope that the directors would succeed in getting a thoroughly practical mining engineer with a knowledge of reduction works to go out.

The CHAIRMAN, in reply to a question, said there could be no doubt that the company lost a large percentage of gold in the present process of reduction.

Mr. CREAK supported the resolution, as he did not see any other way out of their difficulties, and he thought the plan proposed foreshadowed an escape from their present difficulties and a prospect of future advantage. He would like to suggest that some overtures should be made to the Javali Company, who were very much in the same boat as they were, with the view of an amalgamation. Their capital had run out, and they (the Javali Company) were dependent, he believed, on the success of their mines month by month. Latterly their yield had not been very encouraging, and the statement recently issued showed an adverse balance of over 2000*l.* It was in times of adversity that people were sometimes readier to listen to the voice of council than in times of great prosperity, and he could not help thinking that if the Javali shareholders were approached in a liberal spirit—he said it advisedly—something might be done. They owned adjacent properties, and it seemed to him to be absurd that they should have two small companies with a united capital of about 220,000*l.* working there. There must be a great duplication of officers, and so on, and he thought it desirable that in the interests of both companies the two should be united. He trusted that in future the board would show a little more promptitude in dealing with officers who might not give satsfaction.

The resolution was carried unanimously.

The CHAIRMAN then proposed that Mr. J. Jameson Truran be appointed liquidator.

Mr. CREAK seconded the proposition, which was also carried unanimously.

The CHAIRMAN proposed—"That the liquidator be and he is hereby authorised to enter into such agreement, and to execute and do all such assurances and things as may be necessary for carrying into effect the following scheme, namely:—

1.—A new company (to be called the Chontales Company, Limited, or some other suitable name) shall be forthwith formed and registered under the Companies' Acts, 1862 to 1879, as a company limited by shares with a nominal capital of 125,000*l.* divided into 125,000 shares of 1*l.* each.

2.—So soon as the new company shall have been constituted, the liquidator or liquidators of the old company shall, in accordance with the provisions of the 161st section of the Companies' Act, 1862, sell and transfer to the new company the whole of the business and property of the old company, in consideration of (*a*) 125,000 shares in the new company, with the sum of 15s. being credited as being paid up on each share to be allotted as hereinafter-mentioned, or such less number of shares so credited as aforesaid as may be accepted on allotment; (*b*) such sum or sums of money (if any) to br paid and provided by the new company as may be required for the purchase, under the said 161 section, of the interests of dissentient members of the old company, and (*c*) such further sum in cash as shall be sufficient to pay in full all the debts and liabilities of the old company, and the costs and expenses of winding it up. The new company shall also as part of the consideration for the said sale indemnify the old company and the liquidator or liquidators thereof against all liabilities of the old company, and the costs and expenses of winding it up and all claims and demands in respect thereof.

3.—The said 125,000 shares, with the sum of 15s. credited as paid up on each share respectively, shall be allotted to and divided amongst such of the shareholders of the old company as assent to this scheme, each of such shareholders being entitled to receive two of such new shares for each share held by him in the old company. So many of such new shares as shall not be accepted by shareholders in the old company shall be allotted or dealt with by the new company as they shall see fit.

4.—The objects for which the new company is to be established shall be stated in the Memorandum and Articles of Association thereof in such terms as shall enable the new company (in addition to the objects for which the old company was formed) effectually to carry out this scheme.

In putting this resolution he would explain that it was proposed to take the liabilities of the old company, and that out of the 1s. per share paid on allotment, and 1s. per share on application, the directors would pay off the debentures, so that the new company would start perfectly free from the debenture debt. The balance of the amount which would be received if 2s. per share were paid on the new shares would enable the board to send out a person to report upon the reduction works in particular and the mines generally. The directors had at the informal meeting pledged themselves not to call up anything beyond the 2s. per share payable on application and allotment until such a report should have been submitted to the shareholders and accepted by them at a general meeting; so that if the report should be unfavourable there would be no necessity to call up any more money; and if, on the other hand, the report should be a favourable one, as he believed it would, they could then decide as to the future.

Rev. T. BROWN seconded the proposition, but expressed a hope that the shares would be credited with a larger amount than 15s.

Mr. STIEBEL proposed as an amendment that the liability on each of the new shares should not exceed 2s. 6d.

Mr. BISCHOFF said that would not cover the liabilities of the company.

Mr. PARKE PITTAR thought the liability should be reduced *from* 5s. to 4s., though he did not believe that even the smaller amount would *be* required. He had been specified as one of the gentlemen who wished to get the mine into his own hands, but he was anxious that the whole of the shareholders should join in the new company. They were perfectly satisfied with the gentleman who was now in charge of their works, but the great difficulty was to extract the gold more satisfactorily. Heretofore their great want had been cash. They raised 5000*l.* by the issue of debentures, but the amount came in in such a dilatory way (and the whole of it was not yet in) that the directors had never been thoroughly able to tackle their difficulties. He would most positively dissent from any attempt to join the Javali Company. They had quite enough difficulties of their own without joining in others. As a very large share and debenture holder, he was anxious that the company should be a success, and he need not add that he would be unwilling to pay any calls that were not really necessary.

Rev. Mr. COOPER thought there was as much danger in having too much capital as too little.

Mr. C. S. HILL expressed himself in favour of having a proper amount of capital to enable them to work the mines on a larger scale, for they had had quite enough of the difficulties resulting from limited operations.

Mr. BROWN joined Mr. Pittar in the recommendation that each of the new shares should be credited with 16s., making the liability of the shareholders 8s. on each of the shares they now held, while Mr. Creek and Mr. Nicholls supported the original proposition, Mr. Creek stating that if all the shares were taken up they would receive 31,000*l.* Of this about 11,000*l.* would go in paying off the debentures and other liabilities, and of the balance 8000*l.* would be required to open out the Pavon Mine—that is if the report should jussify such an expenditure.

Mr. PITTAR added that he was willing to take up 8000 of the new shares.

The CHAIRMAN said he hoped the shareholders would reconstitute their board, for the present members did not wish to force themselves on the new company by any means.

Mr. Siebel's amendment was not seconded, and fell to the ground.

Mr. PITTAR theu proposed that the new shares should be credited with 16s. paid, and that the future calls should be limited to 6d. per share at intervals of not less than three months.

Mr. BROWN seconded the amendment, which was carried, and the original resolution as amended was then put and carried unanimously.

The CHAIRMAN stated that Mr. White—in answer to a question whether he would go on as manager of the company for a fresh term, as his term was nearly over—said that he was willing to continue his services as their manager for another term of three years, with an increase of 50*l.* a year for the first and second year, and on condition of getting the mine to make regular profits, that he should have an addition of 100*l.* in the third year. He (the Chairman) thought that showed that Mr. White was not afraid that the mines would not be successful. Negociations were now going on which he hoped would result in the appointment of an efficient reduction officer.

On the motion of the Rev. Mr. COOPER, seconded by Mr. CREEK, a vote of thanks was passed to Earl Nelson for presiding, and the meeting then terminated.

JAVALI COMPANY.

The twelfth ordinary general meeting of shareholders was held at the offices, St. Swithin's-lane, on Wednesday,

Vice-Admiral Sir LEOPOLD G. HEATH, K.C.B., in the chair.

Mr. EDWARD SCHUBERT (the secretary) read the notice calling the meeting.

The CHAIRMAN said—Gentlemen, the report comprises all that we have to tell you. You will see by Table 1 that everything went on most prosperously as far as the month of April, so much so that we hoped before the end of the year to pay off a certain amount of debentures, and perhaps also to pay a small dividend. The ore, however, and the manto at the same time very suddenly became of much less value than in the earlier part of the year; and if you carry your eye down the last column of the Table you will see, with very slight variations, the ore all through the last eight months of the year was not of paying value. The general result has been that we submit to you the worst report which this board has ever had to publish. The amount of loss is not in itself so very serious, being 430*l.*; but, feeling it was our duty to keep faith with the debenture-holders so long as we had any money with which to pay the dividend, we continued to pay the debenture interest during the year out of the earnings which we had in store. These earnings, as you will see by the accounts, are now exhausted, and I am afraid when May 1 comes we shall have to request the debenture-holders to be patient, and give us time to pay the coupon then due. I have given you the worst side of the question most unreservedly; but it would not be a right thing not to tell you neither the board nor manager feel discouraged. We know that the value of our ore, especially of the quartz, has often before varied to as great an extent as now; the only thing is we have not hitherto met with bad ore for so long a period without coming upon better. If you will look down Table 1, to which I have already referred, you will see from September onward a steady although slow improvement, and for the month of January, the latest of which we have any returns, there has been a still further improvement. The last letter from the mine leads us to expect that the improvement would go on, at least through the month of February. The mail, unfortunately, although over due, has not arrived, and we are unable to give you. as we had hoped, the very latest accounts. Another reason why we are not discouraged is that our manager a few months ago, after taking great pains and much trouble, believes he has discovered a way of getting considerably more value out of the tailings than he has hitherto done. To carry out the work on a large scale he requires money for the purchase of concentrators, which we have not got at the present moment; but the tailings are heaped ready for the time when we are able to supply the machinery, and the value of the stuff, although not recovered as yet, is to come in the future. Notwithstanding our pressure we have gone on repairing and keeping up the mine, and everything there is in perfect working order. Besides, we have done a very considerable amount of prospecting throughout the year; we are in hopes of tapping a rich part of the mine which formerly gave great riches to the proprietors, and we have reason to believe we shall get good ore from that point of the mine. There is not much to sav on the accounts. If you compare the revenue for the past two years you will see there is very little difference as to the expenditure. In this year there has been an amount paid for passage money which was not paid in the former year, about 120*l.*, and there has been about 300*l.* more paid for goods shipped to the mine than in the former year. These two sums together will about just make up the loss on the working which the accounts show this year. The salaries are slightly increased by reason of our having increased the salaries of one or two of the gentlemen out there. The wages at the mine are almost precisely the same. We have done our best to urge economy upon the managers, and we believe they have brought down the expenses to as low a point as is consistent in doing the amount of work which they get through. I now beg to move that the report and accounts be received and adopted.——Mr. CHARLES GREEN seconded the resolution, which was put and carried without any discussion.

Mr. CHARLES GREEN proposed the re-election of Sir Leopold G. Heath, K.C.B., as director, and spoke in high terms of the great attention which Sir Leopold gave to the business of the company, adding that if the property were Sir Leopold's own he could not bestow more care upon it.——Mr. R. G. HALL seconded the resolution, which was put and carried.

Mr. STOKES moved the re-election of Mr. Charles Frewer, the auditor, which was seconded by the CHAIRMAN, who spoke in high terms of the efficient way in which Mr. Frewer had performed his duty.——The motion was put and carried.

On the motion of the CHAIRMAN, seconded by Mr. HOPPER, cordial votes of thanks were passed to the Chairman, directors, and managers; and the meeting broke up.

SOUTH CONDURROW MINING COMPANY.

A four-monthly meeting of adventurers was held at the offices, Austinfriars, on Thursday,

Mr. H. J. MARSHALL in the chair.

Mr. J. HICKEY (the secretary) read the statement of accounts, which showed a profit of 3259*l.* 7s. 2d. for the past four months.

Capt. RICH read his report, as follows:—

April 13.—In reviewing the operations in this mine since your last general meeting in the early part of January, we have to state that we have not stamped so much tinstone as usual, owing not only to the hardness of the stuff, but one of the old stamps axles having broken down, it necessitated the having of a new one, which caused considerable delay and hindrance to the stamping. We have also a very weak centre of fly-wheel and shaft, and experience great difficulty in keeping the crank firm on this shaft, but we have had a new shaft and crank ordered for some time, and expect it will be delivered on the mine in a few days. We hope soon to put this in order, and thereby stamp more stuff. We are still pushing on the extension of the dressing-floors at the surface, which is highly necessary. In the exploratory works underground the 93 end east is worth 5*l.* per fathom. The 80 end, east of King's, is extended a considerable distance; the south part of the lode in this end has iately yielded some fine native and grey copper, but at present the lode is not so good for copper. The tin part of the lode is standing north, which we are cross-cutting to prove. As far as can yet be seen the lode is worth 10*l.* per fathom for tin. The 80 end, east of Plantation shaft, is worth 9*l.* per fathom. The 80, west of this shaft, is worth 12*l.* per fm. The 70 west yields a little tin; the lode here has been disordered for some time, owing to small cross-branches, but in the extreme end there is at present a small branch of copper, and the tin lode in the south of it seems to be getting better defined. We have started a cross-cut south at the 70 to intersect the Wheal Grenville lodes directly to the west of that mine. A good discovery in this cross-cut will be most important, as we can follow the lodes to any depth at this point. We purpose to open on the back of the Wheal Grenville lodes at the surface in the new ground now dry weather is likely to set in. The winze in the bottom of the 70, west of Plantation shaft, is worth 10*l.* per fathom. The lode in the rise in the back of this level is worth 8*l.* per fathom. The 70 end, east of King's, is worth 10*l.* per fathom. The rise in the back of this level is worth 12. per fathom. We have resumed driving the 60, east of King's; the lode has a strong and kindly appearance. We have put out a trial cross-cut north at the 50, east of Plantation shaft, but nothing of importance having been met with, the men are now employed in putting up a speculative rise on the course of the lode in the back of the 50. The lode in the No. 1 rise is worth 18*l.* per fathom. The lode in the 50, east of King's, is worth 15*l.* per fathom. The rise in the back of this level behind the end is worth 18*l.* per fathom. The 40 end east has improved, and is now worth 12*l.* per fathom. Looking at the improvement in this place we have resumed driving the 30 end, where the lode has a kindly appearance. The stopes and pitches throughout the mine are producing fair quantities of tinstone. We have recently opened the old Polgine engine-shaft in the south-western part of the new ground, but cannot examine the lode as the water is pooled in the adit. We have begun to clear the adit leading to the lode. This will not only drain off the water, but will allow us to examine the whole of the lodes passing through the property.—W. RICH, W. WILLIAMS, H. ABRAHAM.

The CHAIRMAN proposed that the accounts and agents' report be received and passed, and forwarded to each shareholder.

Colonel COLMACK seconded the resolution, which was put and carried.

The CHAIRMAN said it was not necessary to say much, as the accounts spoke for themselves; and if they had listened to Capt. Rich's report they would know as much about the mine as he could tell them. They would remember at the last meeting something was said about the very large margin which the smelters got between the price they paid for the tin and the standard price. Since that time the margin had dropped from 9*l.* to 4*l.*, and at the present time there was no margin at all. Of course, that could be attributed to different reasons, but he believed it was due to some people of spirit having taken up smelting in Cornwall, which had produced a little wholesome competition. He hoped this would continue, as it could but be a very great benefit to producers of tin, who would be great fools if they did not lend the movemeut a little fostering aid. The amount of tin returned was not so large as it had been, but Capt. Rich's report explained the reason of that. However, the price had risen somewhat, so that the balance in hand enabled the committee to recommend a dividend of the same amount as for the same period of last year—10s. per share—which would absorb 3061*l.* of the profit, and leave a balance of 2461*l.* to carry forward, adding 150*l.* to the balance in hand. That was a dividend which he thought all would be satisfied with, as it amounted to about 28¾ per cent., which was a fair remuneration even for mining. He moved that a dividend be declared of 10s. per share.

A SHAREHOLDER seconded the resolution.

Mr. MACKAY, of Invernrss, suggested whether it could not be notified in the circular calling the meeting that a dividend was going to be paid.

The CHAIRMAN said this could scarcely be done, inasmuch as a dividend was only decided on about an hour before the general meetings were held, and then it was only a recommendation, as the decision regarding the dividend rested with the shareholders.

The dividend of 10s. per share was then declared.

The committee was then re-elected, and a vote of thanks to the Chairman and committee closed the proceedings.

SOUTH CARADON MINING COMPANY.

At a general meeting of shareholders, held at the mine on Tuesday (Mr. RICHARD KITTOW in the chair), the accounts for 12th and 13th months, 1879, and 1st month, 1880, showed a profit of 1032*l.* 18s. 6d. A dividend of 1024*l.* (2*l.* per share) was declared, and the balance of 2550*l.* 19s. 3d. carried to the credit of next account. Messrs. Richard Hawke and Richard Kittow were appointed to act as trustees in conjunction with Mr. Thomas Kittow in respect of the shares held by the adventurers in this mine in the Liskeard and Caradon Railway Company. The following report was submitted:—

April 13.—I am pleased to say our mine is looking well, enabling us to keep up our returns. We are progressing favourably with the sinking of our engine-shafts.—JOHN HOLMAN.

TRUGO MINING COMPANY.

The first meeting of adventurers was held at Penzance on April 7, Mr. GEO. CARTER in the chair. The usual preliminaries having been disposed of, it was resolved to carry on the concern on the Cost-book System, and to open the Cost-book accordingly. The mine was declared to consist of 6000 shares, and a call of 2s. per share was made, payable one-half now, and the remainder in two months.

The report of Capt. JAMES TAMBLYN, which was submitted to the meeting, stated that an adit level has been driven about 50 fms., and three shafts have been sunk—the adit shaft, 7 fms.; Wheal Leisure shaft, 19 fms.; and Cox's, 10 fms. By sinking those shafts and driving different cross-cuts five masterly south-east and north-west lodes underlying south-west have been discovered, all of good size, running parallel, and all about equal distances from each other. The deepest cross-cut in this mine is 14 fms., driven north from Wheal Leisure shaft to cut Wheal Leisure lode, where good copper was found, the dues alone amounting to 110*l.* for copper raised and sold from this point. Another cross-cut was driven in the same direction, and cut Bullock's lode, where a very valuable course of copper was cut; but owing to the insufficient facilities in those days for keeping the water (being only a 9-ft. water-wheel), the mine at this depth was drowned, and all the tools and a considerable quantity of broken ore left behind. From Cox's shaft a cross-cut was driven north and cut Cox's lode, where good copper was also found. Another cross-cut was driven south from this shaft and cut Vivian's lode, where a valuable course of ore was met with; and he is now dressing over a ton of copper raised from this point, which gives a produce of over 20 per cent. for copper. In driving the new cross-cut all of these lodes have been re-opened, and copper found in the whole of them, but more especially in Wheal Leisure and Bullock's lodes. He desires to speak very highly of those last mentioned lodes, for he believes if the water is drawn out of the mine there will be copper enough raised to pay the costs immediately. He is firmly of opinion that by sinking Wheal Leisure shaft 5 fms. deeper, and cross-cutting to those courses of copper ore already mentioned, that a good paying mine will be laid open, and at a very small cost.

WEST BASSET MINING COMPANY.

A general meeting of shareholders was held at the mine on Tuesday,

Mr. J. CLAUDE DAUBUZ in the chair.

The notice convening the meeting having been read, and the statement of accounts submitted, which showed a profit on the 13 weeks working of 5034*l.* 1s 3d., reducing the adverse balance shown at the previous meeting to 650*l.* 8s. 10d. The agent's report was considered highly satisfactory.

Capts. JAMES NICHOLAS and FRANCIS HODGE after reporting upon the various points of operation, stated that "the lode at the 144 fm. level, 50 fms. to the north of this shaft, is 7 fms. 5 ft. wide on the base line, or about 5 fms. wide right angle; we have broken therefrom some good work for tin, and there is every reason to believe, judging from the appearance of the lode, that we shall lay open in this part of the sett a lasting and profitable mine, now worth 10*l.* per fathom. Preparation is being made to work the boring machine in this part of the mine, and it is expected to be complete in from three to four weeks time. The stopes throughout the mine are worth on an average 14*l.* per fathom."

The CHAIRMAN stated that as compared with the previous account the working costs would be seen to be about 1100*l.* increase. Of this some 800*l.* had been expended on permanent works in connection with the dressing-floors at the new stamps, and in providing a portion of the new air pipes in the old skip-shaft. On the other hand, a larger quantity of tin had been produced, which had compensated for the heavier outlay, hence the cost of production had been but slightly increased—say, from 34*l.* 10s. to 35*l.* a ton. When they last met it was anticipated that the debit balance would have been entirely cleared off at the present meeting. Every effort had been made to accomplish this object, but it was considered of even greater importance to push on some much needed additions to the dressing-floors at the new stamps, to prevent as far as may be the loss of tin in the process of dressing. The comparatively small amount of 650*l.* still standing against the adventurers would soon be extinguished. If black tin continued at about its present value they might fairly look forward to a dividend at no distant date. The new air-compressing machinery would be at work in about a fortnight, when more rapid progress would be made in opening up the eastern part of the mine. It was also in contemplation to draw the water from some of the lower levels at Thomas's shaft, so as to extend the workings on the flat lode as quickly as possible. About three weeks since communication was made from the adjoining mine—South Frances—with the West Basset 115 fm. level, west of Percy's. According to Mr. Henderson's dialling both mines had slightly worked into the barrier—6 ft.—which was reserved by the lords around each sett, but neither mine had encroached on the other's boundary.

Capt. NICHOLAS, in reply to a question, stated that the 180, east of Percy's, had very much improved since the report was written. They would find in the report that it was valued at 15*l.* per fathom, and now it was worth from 25*l.* to 30*l.* per fathom, and there was very much ground standing, not only in the head, but above them at that point. This he considered an important improvement.

The CHAIRMAN remarked that the profit which they had succeeded in making had altogether exceeded what any of them could have anticipated a short time since. There was one feature in the accounts to which he would especially draw their attention, and that was that for the first time for a very long period there was an absence of bankers' charges, and that instead of having a balance against them at their bankers, they had now not only a substantial balance in hand, but also a large sum in the shape of bills receivable, which were at present in their hands, for tin sold during the past month, and which had not yet been passed into their banking account. Their financial position, therefore, might be regarded as very favourable indeed. If they looked at the figures in the statement of accounts they would see a variation in the amount of the merchants' bills for the three months ending March. The charges for January were small, they were slightly increased in February, and in March they were increased considerably, but that was accounted for by the fact that the January and February bills had been paid, with the exception of coals and dynamite, while those for March were not yet paid. So far as the mine itself was concerned it was scarcely necessary that he should say a word about it. Last year they succeeded in returning over a thousand tons of tin, and they had commenced the first quarter of the next year with more than a fourth part of that amount.

Mr. DAUBUZ said it had been very satisfactory to the committee to lay before them the accounts, and the change from that time 12 months was very great indeed. At that time they were very heavily burdened with debt, but within the course of a week or two they would be released from every farthing of this. From the prospects of the mine and the general extension of trade, he trusted they might not see a much worse price for tin than they were at present receiving. Speaking for the mine, he thought the adventurers would prefer prices ranging from 50*l.* to 60*l.* a ton for tin than a higher price. The results of high prices were too inevitable, and they could get on very well with the prices he had named. He was convinced that it was to the best interest of the county they should remain so.

The report and accounts were unanimously passed, and the usual complimentary votes terminated the proceedings.

[For remainder of Meetings, see to-day's Journal.]

NEW WATER WHEEL.—A direct-acting water-engine, applicable in shallow quick flowing rivers, has been invented by Messrs. ROMAN and LOUCHET, of Paris. Long wooden frames fitted with paddles or floats are attached to a triple crank, so that two of the series are being acted on by the water, whilst the third is lifted and making the back stroke.

MINERS' SAFETY LAMP.—A self-extinguishing lamp has been invented by Mr. J. M. DOUGLAS, of Edinburgh. A series of teeth are provided inside the screwing portion of the cover, so that upon any attempt to open the lamp a pinion is operated, and by means of bevilled wheels the wick is drawn in the tube.

TWO GOLD MEDALS.

FOX'S PATENT

CORRUGATED FURNACE FLUES,

NOW APPLIED TO OVER

1000 IND. 000 H.P.

PARIS, 1878.

SOLE MAKERS—

The LEEDS FORGE CO., Ltd.,

Leeds, Yorkshire.

PRICE LISTS AND PARTICULARS ON APPLICATION.

INCREASED VALUE OF WATER-POWER.

MacADAM'S VARIABLE TURBINE.

This Wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, and yet work with equal efficiency through all variations of quantity down to a fifth, or even less if required. It is easily coupled to a steam-engine, and in this way always assists it by whatever amount of power the water is capable of giving, and therefore saves so much fuel.

This Turbine is applicable to all heights of fall. It works immersed in the tail-water, so that no part of the fall is lost, and the motion of the Wheel is not affected by floods or back-water.

References to places where it is at work will be given on application to—

MacADAM BROTHERS AND CO., BELFAST.

Lectures on Practical Mining in Germany.

AUSTHAL MINING SCHOOL NOTES*—No. CXLIX.

BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.,

Mining Engineer, Wakefield.

(Formerly Student at the Royal Bergakademie, Clausthal.)

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That this enormous temperature of the air is due to insufficient entilation is proved by the fact that many coal mines exist with a epth equal to that of the mines we have cited, where a proper air current not only keeps the working places sufficiently cool for the men to work in with ease, but even reduces the temperature of the surface of the rock.

Tin lodes are generally found to be much cooler than copper lodes of the same depth, so that a high temperature of the rock is generally said to indicate copper deposits. This may result partly from the better conducting power of copper ores, but is probably due to the oxidation of the pyrites.

According to experiments by Despretz, a miner gives off sufficient heat to raise 34,000 cubic feet of air 1° in temperature per hour, or 566 cubic feet per minute, and his light will communicate the same increase of temperature to 26,000 cubic feet of air per hour, or 466 cubic feet per minute, so that a collier and his light will raise 1000 cubic feet of air 1° in temperature per minute. If we take it that a horse would raise the temperature as much as three men, we have a colliery containing 300 men and 40 horses the following amount of air increased 1° in temperature per minute:—

300 men, with their lights	300,000	cubic feet.
40 horses=120 men	67,920	„ „
Total	367,920	„ „

or in round numbers 37,000 cubic feet of air raised 10° in temperature per minute. The return air of well ventilated mines at a depth of 400 yards ordinarily varies between 60° to 70°, so that, taking the surface temperature at 55°, 40,000 cubic feet of air per minute would keep the mines tolerably cool, if the rise in temperature, owing to the heating by contact with the rocks and to oxidation of the fine coal, &c., is left out of account. In most well ventilated collieries, containing that number of miners, 120,000 cubic feet of air per minute are passed through the workings; and this would be raised only 3° in temperature, owing to the heat given off from the miners, horses, and lamps.

Amongst metalliferous miners the view has often been held that the greater the depth of the mine the greater is the difficulty of properly ventilating it, owing to the great increase of temperature. From the above it will be seen that it only requires a good current to keep the working places cool; and we shall further on show that the deeper the shafts the greater is the quantity of air which can be got through the workings; indeed, that this proportion increases not simply as the depth but as the square of the depth. There is this difference between metalliferous mines and coal mines generally, which renders ventilation a more difficult matter in the case of the former than in the latter. Coal seams are approximately horizontal, so that the fresh current can be carried at once to the lowest parts of the mine; whereas lodes are more or less highly inclined, and the air current steals at once along the first open level or levels to the upcast shaft. Even that portion which is brought to the lowest level finds its way along the nearest staples and old workings to the upper levels, and misses many of the stopes, the numerous openings from one level to another facilitating its passage from the lower levels. Doubtless a great improvement can be effected with proper stoppings, &c., but the danger to the life and health of the miners is not so evident to managers of metalliferous mines as the presence of fire-damp in collieries.

MOISTURE.—The air always contains a larger or smaller quantity of moisture, dependant on its temperature and pressure, increasing considerably with the former. In the passage of an air current through a mine it becomes more and more charged with moisture, not only from the evaporation from any underground source of water, but also from the burning of lights and the breathing of men and horses. A working miner throws off by exhalation and perspiration from 6 lbs. to 8 lbs. of water per day, and a horse probably four times as much. It is not at all surprising, therefore, that the return air of mines is saturated with moisture, which is often evinced on any cool day by the clouds formed above the outcast of a ventilating fan house, or the upcast of a shaft. Numerous observations with the hygrometer have proved that in almost all cases the air is nearly at the point of saturation in the return air roads. Air in its normal condition at the surface contains about 1·4 per cent. of moisture. Air takes up moisture more rapidly the further the percentage of moisture is off that at saturation; and, as we have mentioned, the percentage of moisture for saturation increases with its temperature. In summer the air at the surface is comparatively warm, and contains a considerable amount of moisture; hence its temperature is raised but little, and the corresoonding amount of moisture which it takes up, or can take up, is but small. In winter, however, the air at the surface is comparatively dry, and much below the temperature of the returns; hence in winter the air current readily absorbs moisture from the face of the coal, timber, &c., and leaves the coal dust extremely dry, and consequently readily raised and dispersed throughout the atmosphere of the mine, rendering it much more liable to become explosive when fire-damp is present. This may account to a slight extent for the greater liability which there seem to be of explosions in winter, the maximum of explosions in England being in January. The removal of moisture from the pores of the coal may render it more open to the exit of gas. Again, when a current of comparatively dry air traverses a goaf it tends to dry up the moisture which may exist in the rock of the roof or floor: this may cause a shrinkage, resulting in a crack in the floor., or a loosening and fall of a greater or less amount of rock in the roof, with the release of a large amount of gas, or the driving out of any gas which may have been lodged in the upper part of the goaf; accounting, again, possibly in some degree for the greater frequency of explosions during the dry winter months.

With regard to the advantage of a dry atmosphere in preserving timber, we need not here repeat our remarks on this subject in the division devoted to mine timbering.

DUST.—The dust which is formed by the working and blasting of the rock or coal, and by the constant passing to and fro of miners and wagons loaded with broken ore or coal along dry levels is often so fine that it floats in the air currents, and being breathed exercises an injurious influence on the lungs of the miners constantly breathing it. It is generally stated that coal-dust, which is so abundant iu the air of dry mines, being constantly taken in by the breathing of colliers, settles on the lungs, which are found quite black, and impregnated with it. According to others, however, the black deposit found in the creases of the tissues of the membrane of the lungs is absent in the case of screeners and others, who are constantly working in an atmosphere more or less impregnated with coal dust. The black deposit of carbon is said to arise from the imperfect combustion of candles or oil in lamps, and is in such a fine state that it lodges in the creases of the membraneous tissue of the lungs, from which it is not dislodged by expectoration, which is the case with coal dust.

In the collieries of the Saarbrucken district the coal dust has been found to increase the liability to explosion of a mixture of fire damp and air. Owing to the researches of M. Vital on an explosion which took place at the Compagnac Colliery, and more recently to the researches carried on in this country by Mr. Galloway, the important part played by the presence of coal dust in facilitating an explosion, and in case of an explosion of aggravating the consequences, are better understood. According to the former a mixture of air and coal dust may be explosive, whilst Mr. Galloway finds that a mixture of air and coal dust alone is not explosive, but that the presence of tbe latter will render explosive an otherwise unexplosive mixture of fire damp and air; indeed, that the amount of gas need not reach 1 per cent., 0·892 per cent. of marsh gas having rendered a mixture of air and coal dust explosive.

LIGHT CARBURETTED HYDROGEN—(Sub-carburetted hydrogen, hydride of Methyl, marsh gas, fire damp)—consists of four volumes of hydrogen and one volume of carbon condensed to two volumes of marsh gas. This is the simplest compound of carbon and hydrogen, and contains the greatest proportion of hydrogen in relation to the carbon. Its composition, according to weight, is 75 per cent. of carbon and 25 per cent. of hydrogen. The term fire-damp is often used indiscriminately for marsh damp and for explosive mixtures of marsh gas and air. This gas results from the decomposition of vegetable matter contained in the mud of stagnant pools, and hence its name of marsh gas. It is one of the principal ecnstituents of coal gas, and the principal constituent of the gas which is given off from the coal seams and strata of coal seams and strata of coal mines, generally averaging from 75 to 95 per cent., which will be seen from the following analyses:—

From a report on the gases and explosions in collieries by De la Beche, Playfair, and Smyth—

	Marsh gas.	Nitrogen.	Oxygen.	Carbonic acid.	Hydrogen.
Wallsend from pipe at surface..	92·8	6·9	—	0·3	—
ditto from Bensham seam..	77·5	26·1	—	1·3	—
Jarrow Bensham seam	83·1	14·2	0·6	2·1	—
ditto Low Main.....	79·7	14·3	3·0	2·0	3·0
ditto 5 ft. 4 in. seam	93·4	4·9	—	1·7	—
Gateshead 5 ft. 4 in. seam.....	98·2	1·3	—	·5	—
Hepburn	85·22	7·98	2·17	3·27	—

This gas is met with in salt mines, in bituminous slates and similar rocks, in combination with most carbon-hydrogen compounds. Its occurrence in brown coal mines is exceptional, but cases have been reported of explosions of fire-damp in brown coal mines.

The occurrence of fire-damp in coals does not depend, as might be at first expected, on the quality of the coal, although it is to some extent dependent on the chemical and physical changes which have taken place in the seam since its first deposition and covering with the superincumbent strata. This gas is found in bituminous as well as non-bituminous coals, in some districts, however, much more plentifully in the non-bituminous coal. Recent experiments by Mr. J. W. Thomas on the South Wales coal shows that the bituminous coals contain little or no marsh gas, but that the steam and anthracite coals are extremely fiery. The following analysis by Mr. Thomas gives the volume and percentage, composition of gases evolved from four samples of coal, each 100 grammes, by heating them in vacuo to 100° centigrade:—

	Volume in cubic centimetres.	Carbonic acid.	Oxygen.	Marsh gas.	Nitrogen.
Merthyr—Bituminous	55·9	36·42	0·80	—	62·78
Rhondda—Semi-bituminous.	73·6	12·34	0·64	72·51	14·51
Aberdare—Steam	205·1	13·21	0·49	81·64	4·66
Pembroke—Anthracite	555·5	2·62	—	93·13	4·25

As will be seen from this analysis the amount of gas contained in coal is very variable, as well as the composition of the gas. The inclination of the coal seam, whether it extends to the surface or not, the cracks which occur in the seam and adjoining strata, the nature and more or less openness of the surrounding work, the greater or less porosity of the coal, the greater or less depth from the surface, all appear to exercise an influence according as the conditions have been more or less favourable to the escape of the gases formed by the decay of the vegetable matter, which was the origin of the coal. This gas is not only given off from the coal, but also from the neighbouring carboniferous strata, shales, &c.

When the gas disengages itself on a fresh cut surface from the pores of the coal, it (sometimes and especially if there is any moisture in the mine, which may have become condensed on the surface of the coal, if the pores contain water) is accompanied by a slight hissing sound, which often resembles that of the waves on the beach, and at other times from some spot more loudly than the rest giving a so-called "singing" sound. Within the coal itself the gas occurs very unevenly divided, and it is found chiefly where the coal is soft and friable, and, consequently, as one might expect, often near faults, which, moreover, may serve as canals to lead it from other places. The quantity of gas issuing into a mine from the coal itself depends greatly upon the extent of fresh surface which is opened within a given time; and hence, according to some writers, the great falling off in the amount of fire-damp when the coal is not being worked. In addition to what we may term the regular discharge of gas from the surface of the coal it often bursts forth unexpectedly from fissures in the coal itself, or in the roof or floor, blowing out from the fissure for many months together, as though escaping under a high pressure. These natural discharges are termed blowers, and they seem to indicate that the gas is often under a considerable (several atmospheres) pressure. That such is the case in the case of blowers is a proved fact, and one would imagine *a priori*, that the same is the case for the gas occluded in the coal. This seems further confirmed by the forcing down, often suddenly and with great violence, of coal at the working face. In Northumberland and Durham collieries such collections of fire-damp, which are often found at or near to faults, are called bags of foulness, the pressure being often so great that by the disengagement and escape of the gas large blocks of coal are hurled from their places, and the neighbouring levels and workings in a very short time are completely filled with gas.

Some seams and districts seem very liable to such sudden outbursts—notably, South Yorkshire. The eruptions from the floor give off often immense quantities of gas. At the Strafford Main Collieries, near Barnsley, an outburst of gas from the floor was so sudden that an immense volume of air was immediately brought to the firing point. In August, 1870, a serious outburst of a similar character took place when a hole was bored into the floor to a distance of 25 yards, and a 1¾-inch pipe inserted therein and made tight. A loaded valve and pressure gauge being attached to the end of the tube a pressure of 110 lbs. to the square inch was obtained. After the explosion at Lundhill Colliery the mine was flooded; the pent up gases still issuing into the higher workings supported a column of water about 30 ft. in height—equivalent to a pressure of 12 lbs. to the square inch. The gas issuing from the blowers appears to have the same composition as that issuing from the coal. Bischof (who examined the gas from blowers at the Gerhard and Wellsweiler Collieries, near Saarbrücken, and from a bore-hole at Obernkirchen, which had been driven from the bottom of a ventilating shaft 27 yards below the floor of the coal seam into a bituminous slate) found—

	Marsh gas.	Olefiant gas.	Other gases.
At the Gerhard Colliery	83·08	1·98	14·94
„ Wellsweiler Colliery ..	91·36	6·32	2·32
„ Obern Kirchen.....	79·10	16·11	4·79

Bunsen gives as the analysis from the same bore-hole—

Marsh gas	97·53
Oxygen	·16
Nitrogen.....	9·45
Carbonic acid	2·61=99·75

* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergrath Dr. VON GRODDECK, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.

FOREIGN MINING AND METALLURGY.

The Belgian Iron Trade has remained in much the same state. Neither pig nor iron has varied materially in price. Many transactions are stated, however, to have been carried through upon terms below the rates currently quoted. One Dutch house which endeavoured to do business in iron was not able to carry through transactions below 7*l.* 4s. per ton; but the conditions must have been of an altogether peculiar character as the present basis price of iron upon the Belgian markets is 6*l.* 16s. per ton, with a downward tendency rather than otherwise. Pig is quoted in Belgium at 3*l.* 12s. to 3*l.* 16s. per ton; but if iron falls, pig must necessarily fall also. For exportation some contracts are stated to have been concluded in No. 1 iron at 6*l.* 8s. per ton. A credit for the purchase of 2500 trucks and 100 locomotives for the Belgian State Railways will be shortly solicited from the Belgian Chambers. This credit will amount to 480,000*l.*, and another credit of 920,000*l.* will also be applied for for an extension of the Belgian State system. Steel continues to maintain its price in Belgium. Orders from America have considerably slackened, and may now be said to be almost nil. The Liége Syndicate has decided to send an engineer to South America with the view of securing outlets for Belgian iron in that quarter of the world.

The Belgian Coal Trade has shown an almost general feebleness. It is difficult to give any basis or guiding prices, as almost every one has been buying at different rates, although these prices have been all lower than those current in January. Orders are very scarce, as consumers, anticipating a reduction in prices, are only buying from day to day. Several establishments are also stated to have considerable stocks on hand. Thus several works and forges in the north-east of France and the departments of the Meurthe-et-Moselle and the Ardennes have supplies which will last them for a good six months to come. In the Mons basin prices are still maintained, but business is no longer carried on with the same facility. The Austrian coal trade has presented comparatively little change.

The Parisian house coal trade has arrived at its dead season, and the market has become very dull. There are few orders on hand, and as a consequence of this comparatively few deliveries have been made. Deliveries of coal have continued to be made tolerably regularly upon the Paris market, and having regard to the large stocks on hand, it is expected that prices will experience a further fall. The activity which has been noticed in the demand for industrial coal at Paris has slackened also, but to a less extent. There are large supplies on hand and quotations have exhibited a downward tendency. In the Nord and the Pas-de-Calais the situation has remained nearly the same as it was a fortnight since, except that stocks of industrial coal have increased, in consequence of the supply exceeding the consumption.

There has been a satisfactory current of orders in the Haute-Marne, and as purchasers have been pressing for the execution of contracts, the forges have some little difficulty in satisfying the requirements of their customers, although they are working as vigorously as possible. Coke-made iron has been quoted at 10*l.* per ton; mixed iron at 10*l.* 16s. per ton; and mixed machine No. 20 at 10*l.* 8s. to 10*l.* 12s. per ton. The Orleans Railway Company has just sold 10,000 tons of old rails. Of these rails 8000 tons were purchased by Mr. Fowler, of London, for America, at 5*l.* 10s. 8d. per ton, to be taken at Bordeaux; and 2000 tons by M. Sirot, of Trith St. Leger, at 5*l.* 12s. per ton, to be taken at Ivry.

The Austrian iron trade has presented, if anything, rather a better tone. The Crown Prince Rodolphe Railway Company has sold 690 tons of old rails, and the Western of Bohemia Railway Company about 1000 tons. The construction workshops of the Hungarian State lines will supply a number of iron bridges required for the Kaschau and Oderberger line

PARIS EXHIBITION, 1878.

GOLD AND SILVER MEDALS AWARDED for Steam-Engines & Boilers, also the Special Steam Pump, and Compound Pumping Engine.

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TANGYE'S DIRECT-ACTING
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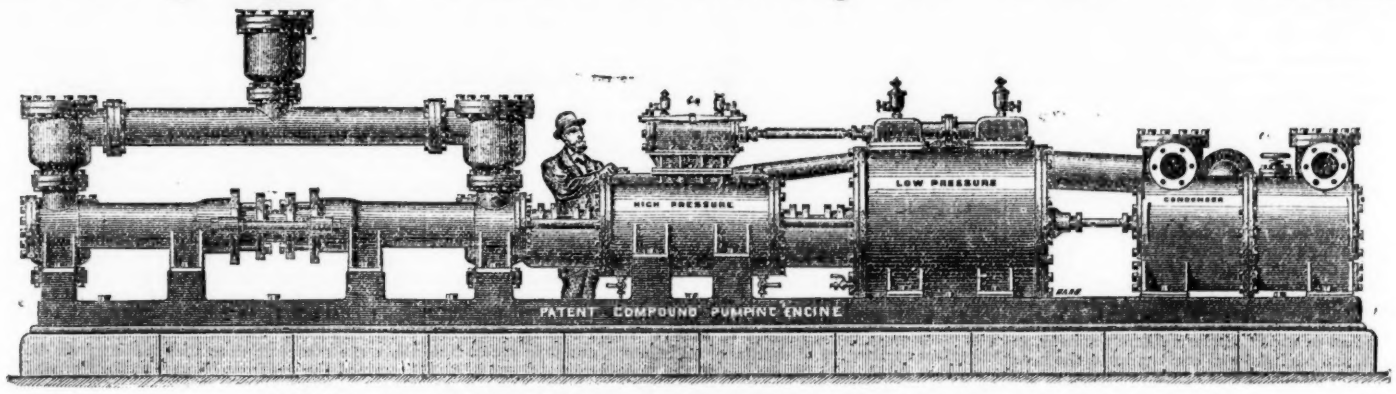
For use in Mines, Water Works, Sewage Works,

And all purposes where Economy of Fuel is essential.



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TANGYE'S COMPOUND PUMPING ENGINE COMBINES SIMPLICITY, CERTAINTY OF ACTION, GREAT ECONOMY IN WORKING, COMPACTNESS, AND MODERATE FIRST COST.

This Engine will be found the most simple and economical appliance for Mine Draining, Town Water Supply, and General Purposes of Pumping ever introduced, and as regards Mine Draining, the first cost is very moderate compared with the method of raising water from great depths by a series of 40 or 50 fm. lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pitwork, are required, while they allow a clear shaft for hauling purposes. In this Engine the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere.

The following first-class Testimonials will bear evidence as to the efficiency and economy of the Engine:—

TESTIMONIALS OF TANGYE'S COMPOUND PUMPING ENGINE.

$\frac{21"}{36} \times 10" \times 48"$ COMPOUND CONDENSING STEAM PUMPING ENGINE.

Newcastle and Gateshead Water Company, Newcastle-on-Tyne, Oct. 20, 1879.

Messrs. Tangye Brothers.

GENTLEMEN,—In reply to your enquiry as to the efficiency of the two pairs of Compound Condensing Engines recently erected by you for this company at our Gateshead Pumping Station, I have great pleasure in informing you that they have far surpassed my expectations, being capable of pumping 50 per cent. more water than the quantity contracted for; and by a series of experiments I find they work as economically as any other engine of the compound type, and will compare favourably with any other class of pumping engine. By the simplicity of their arrangement and superior workmanship they require very little attendance and repairs, and the pumps are quite noiseless. A short time ago I had them tried upon air by suddenly shutting off the column, and found they did not run away, thus showing the perfect controlling or governing power of the Floyd's Improved Steam-moved Reversing Vale. I will thank you to forward the other two pairs you have in hand for our Benwell Pumping Station. Yours respectfully,

(Signed) JOHN R. FORSTER, Engineer.

$\frac{21"}{36} \times 12" \times 48"$ DOUBLE RAM COMPOUND CONDENSING STEAM PUMPING ENGINES.

The Chesterfield and Boythorpe Colliery Company (Limited), Registered Office, Boythorpe, near Chesterfield, Oct. 1, 1879.

Messrs. Tangye Brothers. Supplied in January, 1878.

GENTLEMEN,—Referring to the above, which we have now had working continuously night and day for the last 12 months, we are glad to say that it is giving us every satisfaction. It is fixed about 400 feet below the surface, the steam being taken down to it at pressure of 45 lbs. per square inch. We can work the pump without any difficulty at 28 strokes per minute=224 ft. piston speed. The pumping power is enormous. The vacuum in the condenser being from 11½ to 13 lbs. The pump is easily started, and works well and regularly. The amount of steam taken being much less than we anticipated. We consider the economy in working very satisfactory indeed. The desire for power and economy at the present day will certainly bring this pump into great requisition. Yours truly,

(Signed) M. STRAW, Manager.

SIZES AND PARTICULARS.

Diameter of High-pressure Cylinder	In.	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder	In.	14	14	14	18	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder	In.	4	5	6	5	6	7	8	6	7	8	10	7	8	10	12
Length of stroke	In.	24	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate		3900	6100	8800	6100	8800	12,000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450	35,225
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder	Non-condensing	360	330	160	360	250	184	140	360	264	202	130	360	275	175	122
Ditto ditto ditto	—with Holman's Condenser	480	307	213	480	333	245	187	480	352	269	173	480	367	234	162
Ditto ditto ditto	—with Air-pump Condenser	600	384	267	600	417	306	335	600	440	337	216	600	459	203	203

CONTINUED.

Diameter of High-pressure Cylinder	In.	16	16	16	16	18	18	18	18	21	21	21	24	24	24	30	30
Ditto of Low-pressure Cylinder	In.	28	28	28	28	32	32	32	32	36	36	36	43	42	42	52	52
Ditto of Water Cylinder	In.	8	10	12	14	8	10	12	14	10	12	14	10	12	14	12	14
Length of stroke	In.	36	36	36	36	48	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate		15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,050	35,225	47,960
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder	Non-condensing	360	230	160	118	456	292	202	149	397	276	202	518	360	264	562	
Ditto ditto ditto	—with Holman's Condenser	480	307	213	154	603	389	269	198	528	363	269	691	480	352	750	
Ditto ditto ditto	—with Air-pump Condenser	600	384	267	191	750	486	337	248	660	450	337	864	600	440	937	

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Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

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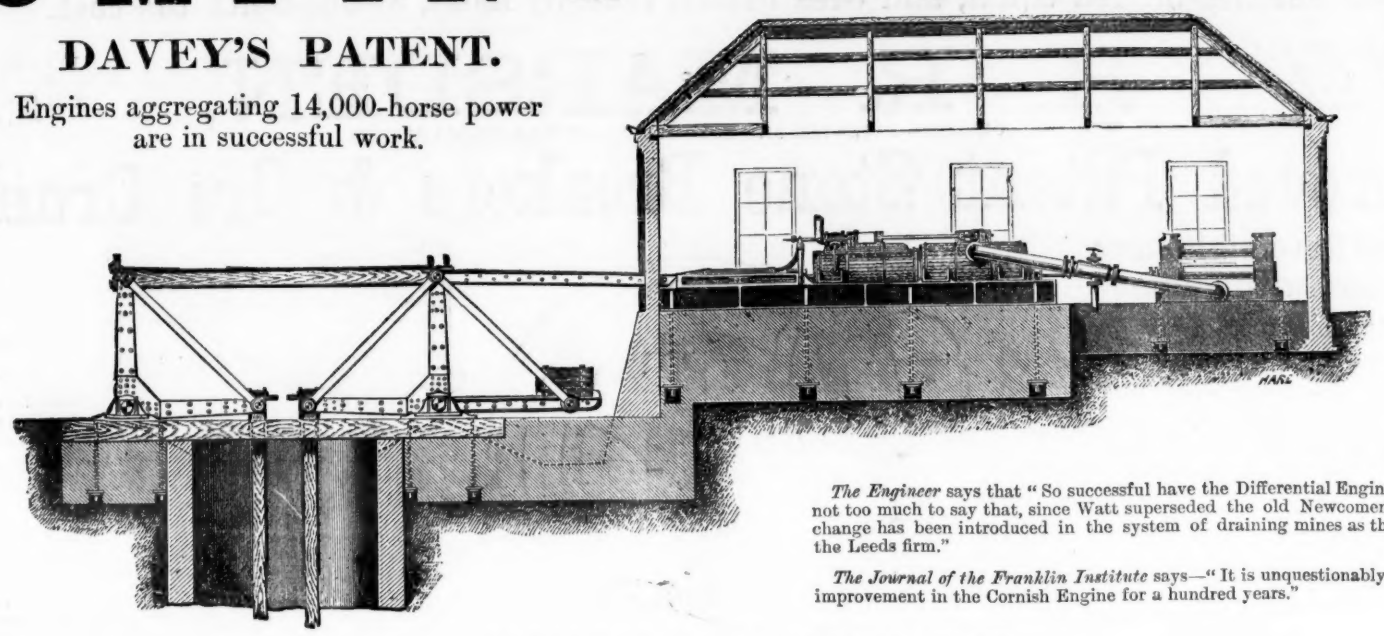

The Engineer says that "So successful have the Differential Engines been, that it is not too much to say that, since Watt superseded the old Newcomen engine, no such change has been introduced in the system of draining mines as that introduced by the Leeds firm."

The Journal of the Franklin Institute says—"It is unquestionably the most marked improvement in the Cornish Engine for a hundred years."

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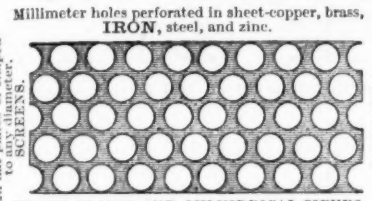

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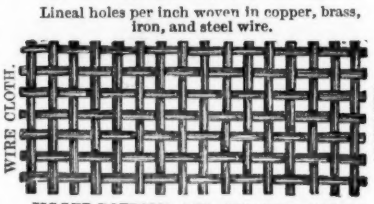
WIRE CLOTH. Strong web, flue cross SIEVING.



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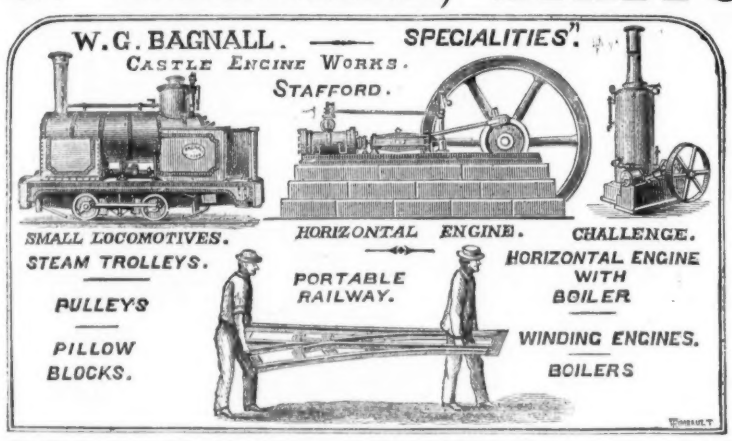

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New Patent Brick-making Machine

Embraces the following advantages—viz.:

Simplicity, strength, and durability. Compactness and excellence of mechanical arrangements, large producing capabilities, moderate cost.

It makes two bricks at once, and will make 12,000 to 14,000 plastic pressed bricks per day, hard enough to go direct to the kiln without drying; or it will make the bricks thoroughly plastic if required. For works requiring a machine at less cost the machine is made to turn out one brick at once, and is capable of producing 8000 bricks per day.

The Machine can be seen at work daily at the Brickworks of the Patentees, JOSEPH FIRTH AND SONS, WEBSTER HILL, DEWSBURY, as also their Patent Gas Kiln for Burning Bricks, which possesses the following amongst other advantages, viz.:—Economy in Fuel, Rapidity and Quality of Work, even Distribution of Heat, and Total Consumption of Smoke.

[*See Illustrated Advertisement every alternate week.*]

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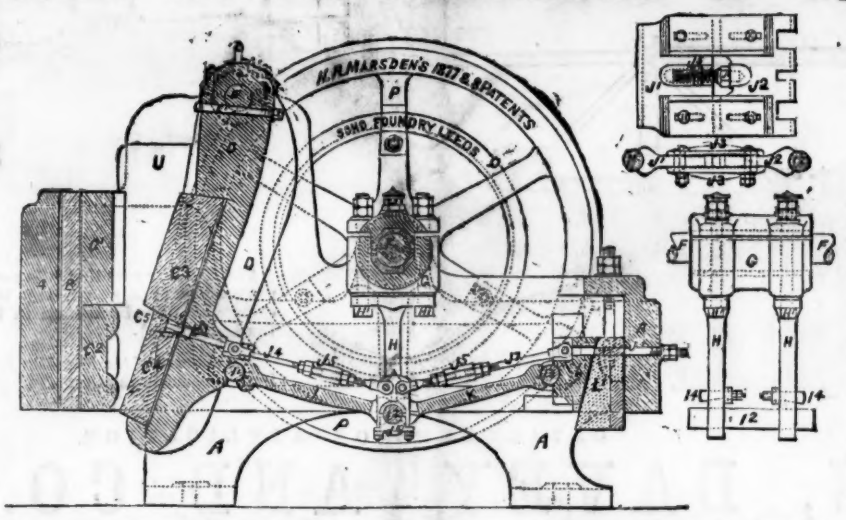

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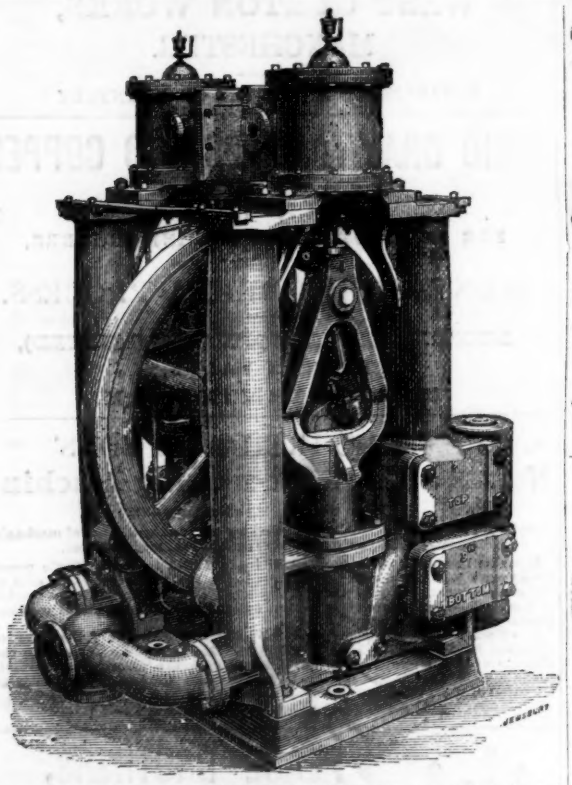

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